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REPORT

OF THE

DIRECTOR OF THE MINT

UPON THE

PRODUCTION OF THE PRECIOUS METALS

IN THE

UNITED STATES

DURING THE

CALENDAR YEAR 1902.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1903.

Treasury Department,
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Director of the Mint.

CONTENTS.

Page.
Letter of Transmittal 5
Part I:
Production of gold and silver in the United States, 1902 9
Deposits of gold 17
Deposits of silver 18
Coinage of the United States 20
Purchases of silver 21
Imports and exports of the precious metals 22
Movement of gold from the United States 25
Imports and exports of the principal countries of the world 26
The market for silver in 1902 30
Exports of silver to the East 31
Value of net imports of silver into India since 1835 32
Gold and silver imported into and exported from British India 32
Imports and exports of bullion into and from London 33
Stock of money in the United States 34
Gold and silver used in the industrial arts 35
World's industrial consumption of the precious metals 39
World's production of gold and silver in 1902 42
World's coinage 46
Part II:
Reports of the special agents of the Bureau of the Mint on the production of the precious metals in 1902 in the several States and Territories 49
I.—Alaska 49
II.—Arizona 55
III.—California 76
IV.—Colorado 88
V.—Idaho 134
VI.—Montana 143
VII.—Nevada 150
VIII.—New Mexico 168
IX.—Oregon 178
X.—Southern Appalachian States 186
XI.—South Dakota 194
XII.—Utah 200
XIII.—Washington 207
XIV.—Wyoming 214
Part III:
Production of gold and silver in foreign countries 221
Africa 280
Argentina 251
Australasia 276
Austria-Hungary 261
Bolivia 244, 246
Brazil 242
British India 268
British North America 223
Central America 221
Chile 244, 248
China 265
Colombia 234
East Indies 270
Ecuador 240
Egypt 260
Finland 258

PART III—Continued. Page.

Production of gold and silver in foreign countries—Continued.

France 262
Germany 260
Great Britain 260
Greece 264
The Guianas 236
Italy 263
Japan 269
Korea 265
Mexico 226
Norway 258
Paraguay 254
Persia 264
Peru 244
Philippines 272
Porto Rico 231
Portugal 263
Russia 256
Siam 268
Spain 262
Sweden 259
Turkey 264
Uruguay 254
Venezuela 240
West Indies 229
Yukon (*see* British North America) 223

PART IV. GENERAL STATISTICS:

TABLE I.—Deposits and purchases of gold and silver, by weight 288
II.—Deposits and purchases of gold and silver, by value 290
III.—Deposits of unrefined gold of domestic production, by weight 292
IV.—Deposits of unrefined gold of domestic production, by value 294
V.—Deposits of unrefined silver of domestic production, by weight 296
VI.—Deposits of unrefined silver of domestic production, by value 298
VII.—Bars manufactured, by weight 298
VIII.—Bars manufactured, by value 300
IX.—Recoinage of United States gold and silver coins, calendar year 1902 300
X.—Quantity and cost of silver used in the coinage of silver dollars 302
XI.—Quantity and cost of metal obtained by transfer and purchase for subsidiary coinage 303
XII.—Coinage of the United States during the calendar year 1902 306
XIII.—Assets and liabilities of mints and assay offices December 31, 1902 308
XIV.—Unrefined domestic gold and silver bullion deposited at the mints and assay offices to the close of the calendar year 1902 310
XV.—Production of gold and silver in the United States, annually, from the organization of the Mint 311
XVI.—Highest, lowest, and average price of silver in London since 1833 312
XVII.—Ratio of silver to gold each year since 1687 313
XVIII.—Imports of gold and silver coin and bullion, by districts 314
XIX.—Imports of gold and silver coin and bullion, by countries 316
XX.—Exports of foreign gold and silver 318
XXI.—Exports of domestic gold and silver 320
XXII.—Recapitulation of imports and exports 322
XXIII.—Imports and exports of the principal countries of the world 323
XXIV.—Coinage of nations, 1900, 1901, and 1902 348
XXV.—World's production of gold and silver, 1900, 1901, and 1902 349
XXVI.—Production of gold and silver in the world since the discovery of America 352
XXVII.—Coinages of the United States, by denominations and values, since the organization of the Mint 354
XXVIII.—Fractional and subsidiary coinage since 1792 355
XXIX.—Coinages, by institutions, from organization of the Mint 356

LETTER OF TRANSMITTAL.

Treasury Department,
Bureau of the Mint,
Washington, D. C., December 1, 1903.

Sir: I have the honor to hand you herewith my report on the production of gold and silver in the United States and in the world for the calendar year 1902, together with such information as to their coinage and consumption as this Bureau has been able to gather. The returns for this country have been carefully obtained through officials and special agents of this Bureau, and the aggregate of precious metals reported has been actually traced from production to market. The figures are therefore conservative, but are believed to be approximately full. The statistics for foreign countries are obtained from official sources wherever governmental calculations are made, and where such returns can not be had the best obtainable estimates are given and the authority stated.

Respectfully,

Geo. E. Roberts,
Director of the Mint.

The Secretary of the Treasury.

PART I.

PRODUCTION, EMPLOYMENT, AND MOVEMENT OF GOLD AND SILVER IN THE UNITED STATES, AND SURVEY OF THE WORLD'S PRODUCTION OF GOLD AND SILVER IN 1902.

GENERAL REPORT.

PRODUCTION OF THE PRECIOUS METALS IN THE UNITED STATES DURING THE CALENDAR YEAR 1902.

During the calendar year 1902 the United States produced 3,870,000 fine ounces of gold, of the value of $80,000,000, as against 3,805.500 ounces, valued at $78,666,700 in 1901. There was, consequently, an increase of 64,500 fine ounces, or 1.69 + per cent. The production was the largest ever made by the United States.

The silver yield for 1902 amounted to 55,500,000 fine ounces, of the commercial value (at 53 cents per ounce) of $29,415,000. There was a gain in actual production, as compared with the amount won the previous year, of 286,000 fine ounces, but a loss in commercial value, owing to the fall in price, of $3,326,140. The coining value of the yield of 1902 was $71,757,575.

The average price of silver fell from 60 cents in 1901 to 53 cents in 1902.

Comparing the total value of the precious metals produced in the United States in 1902, $109,415,000, with that of the previous year, $111,795,100, there was a decrease of $2,380,100, or 2.1 + per cent.

Of the producing States and Territories, eight increased their output of gold to the extent of $2,889,500, while the remaining States show a decrease of $1,556,200. In silver, thirteen States show an increase of $1,742,746; the remaining States a decrease of $1,591,166.

Arizona.—In this Territory there was an increase in the gold production of 1902, as compared with the yield of the previous year, of 1,418 fine ounces, and in silver of 230,700 ounces. These gains in production were not sufficient, however, to offset the loss in value of silver, caused by the fall in price, the total value of the yield of the precious metals in Arizona in 1902 having been $5,725,143, against $5,770,440 the previous year, a decrease of $45,297. It is stated that the yield would have been much larger but for the drought which prevailed almost throughout the year.

Colorado.—Colorado's gold production increased from 1,339,673 fine ounces in 1901 to 1,377,175 in 1902, a gain of 37,502 fine ounces, while her silver yield in the latter year shows a decrease of 2,761,800 fine ounces, the output having been only 15,676,000 ounces against 18,437,800 the preceding year. The total value of the precious metals produced in this State in 1902 was $36,776,980 against $38,756,180 in 1901, a loss of $1,979,200, due to the decreased production and lower price of silver. The diminished production of silver is explained by the low price which prevailed throughout the year.

Georgia.—Georgia's production of the precious metals is always insignificant. In 1902 the gold yield amounted to 4,730 fine ounces, a decrease as compared with the output of 1901 of 1,293 ounces, while the silver yield was the same both years, viz, 400 fine ounces. The decrease in total value was $26,688.

Idaho.—In 1902 the gold yield of Idaho was 19,075 fine ounces less than it was the previous year, when it amounted to 90,427 ounces. There was, however, an increase in the silver production of 311,900 fine ounces. In spite of this gain the loss in gold production and fall in price of silver combined to lessen the total value of the precious metals produced during the latter year to the extent of $616,996. The decreased gold yield was chiefly due to lack of water and to the shortness of the season.

Michigan.—Michigan is reported as having produced no gold in 1902, but her silver yield increased from 81,000 ounces in 1901 to 110,800 fine ounces the following year, a gain of 29,800 fine ounces, and of $10,124 in commercial value, the output having been worth $58,724.

Montana.—Montana's loss in value of precious metals produced in 1902, as compared with yield of 1901, was $1,230,306. In gold there was a decrease of 17,924 fine ounces, but in silver a gain of 112,100 fine ounces. The loss in total value was due chiefly to the fall in the price of silver. It is stated that the decreased output of gold was due to the steady decline which has been taking place for years in the productivity of the placers, and also to the fact that some of the mills were idle during part of the year. The low price of lead and silver, and labor troubles in certain localities account for the fact that the yield of silver, although it showed a gain, was not as great as had been anticipated.

Nevada.—In 1902 Nevada produced 140,059 fine ounces of gold against 143,374 ounces in 1901; there was, consequently, a decrease of 3,315 fine ounces. In silver there was a gain in 1902 of 1,933,700 fine ounces, the yield in that year having been 3,746,200 ounces against 1,812,500 in 1901. The gain in total value of the two metals was $829,386. The great increase in amount of silver produced—over 100 per cent—is due chiefly to developments in the rich Tonopah district, in Nye County.

New Mexico.—In 1902, as compared with the preceding year, gold production in New Mexico fell off 7,609 fine ounces, and silver 106,200 fine ounces. This decrease in the yield of both metals and the fall in the price of silver combined to cause a diminution in the total value of the yield of the precious metals during 1902 of $253,024.

North Carolina.—North Carolina's production of gold is relatively slight, but in 1902 it increased, as compared with the output of 1901, 1,705 fine ounces, it having been 4,390 ounces in the former year; there was likewise a gain of 600 fine ounces of silver. There was an increase in the total value of the precious metals produced in the State of $34,097, a gain of over 50 per cent.

Oregon.—There was but a slight change in the gold production of Oregon for 1902 as compared with 1901, it having been 87,881 fine ounces in the former year and 87,950 in the latter; there was, however, a marked falling off in the silver yield, it having been 160,100 fine ounces in 1901 and only 93,300 in 1902, a loss of 66,800 ounces. The total value of the precious metals produced in Oregon in 1902 was $1,866,149 as against $1,914,160 the preceding year, a decrease of $48,011. It is stated that the decreased production of silver was due to the changed characteristics in some of the ores treated, showing increasing values in gold and a corresponding decrease in silver values.

South Carolina.—South Carolina's gold production in 1902, as compared with that of 1901, increased 3,637 fine ounces, or over 161 per cent, the yield in 1902 having been 5,896 fine ounces. Her silver output, which is always insignificant, increased from 200 to 300 ounces. The total value of the precious metals produced in the State in 1902 was $122,059 against $46,820 in 1901.

South Dakota.—In 1901 South Dakota produced 313,446 fine ounces of gold, and in 1902, 336,952; there was consequently an increase of 23,506 ounces. During the former year the yield of silver was 78,000, and in the latter 340,200 fine ounces, a gain of 262,200 ounces, or over 336 per cent.

Texas.—This State is reported as having produced no gold in 1902, the amount of 29 fine ounces having been credited it in 1901. The silver production, which in that year amounted to 472,400 fine ounces, dropped in 1902 to 446,200. Owing to this decreased production of 36,200 ounces and the fall in price, the value of the yield of 1902, which was $236,486, shows a decrease of $46,954 when compared with the output of 1901.

Utah.—Utah lost in gold 4,627 fine ounces, but gained in silver 70,900 ounces. The total value of the product of the precious metals in 1902 was $9,336,301—a decrease, when compared with that of 1901, of $810,379, chiefly due to the fall in the price of silver.

Washington.—There was a large decrease in the amount of gold produced in Washington in 1902 as compared with 1901, when it amounted to 28,082 fine ounces; in 1902 it was only 13,166 ounces—a loss of 14,916, equivalent to 53+ per cent. On the other hand, there was a notable gain in the production of silver; in 1901 the yield amounted to 344,000 fine ounces and in 1902 to 619,000—a gain of 275,000. Notwithstanding this increase the total value of the precious metals produced in Washington in 1902 was $186,870 less than it was the previous year, when it amounted to $787,140. This decrease was due to both the diminished production of gold and also to the fall in the price of silver. The decrease in gold production was due to the complete shutting down of certain mines which were in operation in 1901. The gain in silver came chiefly from Stevens and Snohomish counties.

Comparative statements of the production of the precious metals in 1901 and 1902 in the several States and Territories are found in the following table:

PRODUCT OF GOLD IN THE SEVERAL STATES AND TERRITORIES IN 1901 AND 1902 AND THE INCREASE OR DECREASE OF THE PRODUCTION OF EACH IN THE LATTER YEAR.

State or Territory.	Value.			
	1901.	1902.	Increase.	Decrease.
Alabama	$3,100	$2,500		$600
Alaska	6,885,700	8,345,800	$1,460,100	
Arizona	4,083,000	4,112,300	29,300	
California	16,891,400	16,792,100		99,300
Colorado	27,693,500	28,468,700	775,200	
Georgia	124,500	97,800		26,700
Idaho	1,869,300	1,475,000		394,300
Maryland		2,500	2,500	
Michigan	30,800			30,800
Montana	4,744,100	4,373,600		370,500

Product of Gold in the Several States and Territories in 1901 and 1902 and the Increase or Decrease of the Production of Each in the Latter Year—Con.

State or Territory.	Value.			
	1901.	1902.	Increase.	Decrease.
Nevada	$2,963,800	$2,895,300		$68,500
New Mexico	688,400	531,100		157,300
North Carolina	55,500	90,700	$35,200	
Oregon	1,818,100	1,816,700		1,400
South Carolina	46,700	121,900	75,200	
South Dakota	6,479,500	6,965,400	485,900	
Texas	600			600
Utah	3,690,200	3,594,500		95,700
Virginia	5,300	3,100		2,200
Washington	580,500	272,200		308,300
Wyoming	12,700	38,800	26,100	
Total	78,666,700	80,000,000	2,889,500	1,556,200
Net increase			1,333,300	

Product of Silver in the Several States and Tetritories in 1901 and 1902 and the Increase or Decrease of the Production of Each in the Latter Year.

State or Territory.	Weight.			
	1901.	1902.	Increase.	Decrease.
	Fine ounces.	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*
Alabama	100	100		
Alaska	47,900	92,000	44,100	
Arizona	2,812,400	3,043,100	230,700	
California	925,600	900,800		24,800
Colorado	18,437,800	15,676,000		2,761,800
Georgia	400	400		
Idaho	5,542,900	5,854,800	311,900	
Michigan	81,000	110,800	29,800	
Montana	13,131,700	13,243,800	112,100	
Nevada	1,812,500	3,746,200	1,933,700	
New Mexico	563,400	457,200		106,200
North Carolina	20,300	20,900	600	
Oregon	160,100	93,300		66,800
South Carolina	200	300	100	
South Dakota	78,000	340,200	262,200	
Tennessee		12,300	12,300	
Texas	472,400	446,200		26,200
Utah	10,760,800	10,831,700	70,900	
Virginia	700	5,900	5,200	
Washington	344,400	619,000	274,600	
Wyoming	21,400	5,000		16,400
Total	55,214,000	55,500,000	3,288,200	3,002,200
Net increase			286,000	

In estimating the gold yield of the United States in any given year only that gold is looked upon as really produced that has been refined, made ready for the market, and the ascertained amount of domestic origin (which is comparatively insignificant) that has been exported to foreign countries for reduction.

It has been the custom of the Bureau of the Mint to make for every calendar year two independent calculations of the gold product of the country, and to take their mean as the closest approximation that can be had to the actual output of the mines. The first of these is based on the amount of gold put upon the market by private refineries during the year, plus the fine gold contained in the unrefined of domestic production deposited at the mints and assay offices of the United States, plus the pure metal of domestic production contained in ores, copper matte, etc., exported to other countries for reduction. The second calculation is based on the known disposition made of the newly produced gold in any calendar year. Such gold is either deposited at the mints and assay offices of the United States, or exported from the United States in form of bullion, ores, or copper matte, or used in the industrial arts. If foreign gold bullion enters into any of the above items its amount must, of course, be deducted.

Put in tabular form, the first calculation of the gold product of the United States in the calendar year 1902 assumes the following shape:

APPROXIMATE GOLD PRODUCT OF THE MINES OF THE UNITED STATES DURING THE CALENDAR YEAR 1902.

Items reported for 1902.	Fine ounces.
Domestic product, in fine gold bars, reported by private refineries	2,694,087
Unrefined gold of domestic production deposited at the mints and assay offices	1,195,943
Domestic gold contained in ores, copper matte, etc., exported for reduction	6,967
Total	3,896,997

The second calculation of the gold yield of the mines of the United States in the calendar year 1902, reduced to a table, is as follows:

APPROXIMATE DISPOSITION OF THE GOLD PRODUCT OF THE MINES OF THE UNITED STATES DURING THE CALENDAR YEAR 1902.

Disposition.	Fine ounces.
Bullion deposited at the mints and assay offices classified as of domestic production	4,626,578
Less refinery bars deposited and reported to this Bureau as from old material	90,426
Net new material deposited	4,536,152
Domestic bullion other than United States mint or assay office bars exported from the United States, as per custom-house returns	121,829
Domestic gold in ores, copper matte, etc., exported	6,967
Bullion of domestic production reported by private refineries in the United States as having been made into bars for manufacturers and jewelers for use in the industrial arts	33,077
Total	4,698,025
Deduct foreign bullion reported to the Bureau of the Mint by private refineries in the United States, as contained in their product of fine gold bars deposited at the mints and assay offices, or entered at the custom-houses for exportation as of domestic production, but derived from foreign ores	862,057
Net total	3,835,968

The difference between the results of these two calculations is only 61,029 ounces, a variation so slight that the mean of the two estimates, 3,866,482—in round numbers 3,870,000 ounces—may be taken as the actual output of the mines of the country.

The silver product of the United States in any given calendar year is estimated in precisely the same manner as the gold product, namely, by making two independent calculations of the same and taking their mean as the actual product.

APPROXIMATE SILVER PRODUCT OF THE MINES OF THE UNITED STATES DURING THE CALENDAR YEAR 1902.

Items reported for 1902.	Fine ounces.
Domestic product, in fine silver bars, reported by private refineries	55,087,074
Unrefined silver of domestic production deposited at the mints and assay offices	408,071
Domestic silver contained in ores, copper matte, etc., exported for reduction	82,906
Total	55,578,051

The second calculation, or disposition of the silver yield of the mines of the United States in the calendar year 1902, is as follows:

Approximate Disposition of the Silver Product of the Mines of the United States during the Calendar Year 1902.

Disposition.	Fine ounces.
Bullion deposited at the mints and assay offices classified as of domestic production...	2,564,219
Less refinery bars deposited and reported to this Bureau as from old material	125,823
Net new material deposited	2,438,396
Domestic bullion other than United States mint or assay office bars exported from the United States (custom-house), rating at commercial value $45,150,327, corresponding at average price of silver during the year to $0.53 per ounce, fine	85,189,300
Domestic silver in ores, copper matte, etc., exported	82,906
Bullion of domestic production reported by private refineries in the United States as having been made into bars for manufacturers and jewelers for use in the industrial arts........	13,629,248
Increase in the approximate stock of silver bars, exclusive of any bars bearing the stamp of a United States mint or assay office, in the United States, held by the Mercantile Safe Deposit Company and other institutions at the close of the calendar year 1902, according to information furnished this Bureau	1,277,980
Total	102,617,830
Deduct foreign bullion reported to the Bureau of the Mint by private refineries in the United States as contained in their product of fine silver bars deposited at the mints and assay offices, or entered at the custom-houses for exportation as of domestic production, but derived from foreign ores	46,972,807
Net total	55,645,023

The average, in round numbers 55,500,000 fine ounces, or 1,726,602 kilograms, fine, valued at $71,757,575 coining value, or $29,415,000 commercial value, is the estimated yield.

In addition to the above sources of information this Bureau has, for a number of years, been collecting statistics of mining production through special agents in the several States and Territories. The following table is a summary of their reports, which are given in another part of the present report:

Product of Gold and Silver in the Individual States and Territories for the Calendar Year 1902.

[As reported by mint officers and agents.]

State or Territory.	Gold.		Silver.			Total value (silver at commercial value).
	Fine ounces.	Value.	Fine ounces.	Coining value.	Commercial value.	
Alabama	142	$2,935	95	$123	$50	$2,985
Alaska	400,710	8,283,409	89,388	115,572	47,376	8,330,785
Arizona	201,240	4,160,000	3,170,000	4,098,586	1,680,100	5,840,100
California	818,037	16,910,320	476,756	616,412	252,681	17,163,001
Colorado	1,379,490	28,516,588	15,800,958	20,429,522	8,374,508	36,891,096
Georgia	5,165	106,770	581	751	308	107,078
Idaho	73,047	1,510,015	5,942,714	7,683,509	3,149,638	4,659,653
Maryland	131	2,708	3	4	2	2,710
Michigan	....	....	110,844	143,313	58,747	58,747
Montana	212,855	4,400,096	13,629,737	17,622,286	7,223,761	11,623,857
Nevada	144,968	2,996,749	3,998,383	5,169,627	2,119,143	5,115,892
New Mexico	18,609	384,685	280,490	362,654	148,659	533,344
North Carolina	4,530	93,643	23,368	30,213	12,385	106,028
Oregon	88,884	1,837,406	109,463	141,528	58,015	1,895,421
South Carolina	7,483	154,687	580	750	307	154,994
South Dakota	345,715	7,146,563	351,000	453,818	186,030	7,332,593
Tennessee	7	145	1	1	1	146
Texas	....	....	446,166	576,861	236,468	236,463
Utah	192,157	3,972,235	12,678,037	16,391,805	6,719,360	10,691,595
Virginia	208	4,300	1,344	1,737	712	5,012
Washington	18,115	374,471	721,450	932,784	382,369	756,840
Wyoming	2,188	45,230	5,200	6,723	2,756	47,986
Total	3,913,681	80,902,955	57,836,558	74,778,579	30,653,376	111,556,331

The total product of the precious metals reported by mint officers and agents in the foregoing table somewhat exceeds either of the above calculations of this Bureau. A difference between the two sets of figures is naturally to be expected, inasmuch as they do not relate to the same thing, the figures reported by mint officers and agents representing the estimated fine contents of the ore, whereas the estimates of this Bureau deal with the finished product only. That the calculations of this Bureau, nevertheless, approximate very closely the results obtained from the mines by mint officers and agents in the several States and Territories vouches for the practical accuracy of the estimates.

The following table gives the weight and value of the finished product, by States, as estimated at this Bureau:

APPROXIMATE DISTRIBUTION BY PRODUCING STATES AND TERRITORIES OF THE PRODUCT OF GOLD AND SILVER IN THE UNITED STATES FOR THE CALENDAR YEAR 1902.

[As estimated by the Director of the Mint.]

State or Territory.	Gold.		Silver.			Total value (silver at commercial value).
	Fine ounces.	Value.	Fine ounces.	Coining value.	Commercial value.	
Alabama	119	$2,500	100	$129	$53	$2,553
Alaska	403,730	8,345,800	92,000	118,950	48,760	8,394,560
Arizona	198,933	4,112,300	3,043,100	3,934,513	1,612,843	5,725,143
California	812,319	16,792,100	900,800	1,164,671	477,424	17,269,524
Colorado	1,377,175	28,468,700	15,676,000	20,267,960	8,308,280	36,776,980
Georgia	4,730	97,800	400	517	212	98,012
Idaho	71,352	1,475,000	5,854,800	7,569,842	3,103,044	4,578,044
Maryland	121	2,500	....	....	....	2,500
Michigan	....	....	110,800	143,257	58,724	58,724
Montana	211,571	4,373,600	13,243,800	17,123,297	7,019,214	11,392,814
Nevada	140,059	2,895,300	3,746,200	4,843,572	1,985,486	4,880,786
New Mexico	25,693	531,100	457,200	591,127	242,316	773,416
North Carolina	4,390	90,700	20,900	27,022	11,077	101,777
Oregon	87,881	1,816,700	93,300	120,630	49,449	1,866,149
South Carolina	5,896	121,900	300	388	159	122,059
South Dakota	336,952	6,965,400	340,200	439,855	180,306	7,145,706
Tennessee	....	....	12,300	15,903	6,519	6,519
Texas	....	....	446,200	576,905	236,486	236,486
Utah	173,886	3,594,500	10,831,700	14,004,622	5,740,801	9,335,301
Virginia	148	3,100	5,900	7,628	3,127	6,227
Washington	13,166	272,200	619,000	800,323	328,070	600,270
Wyoming	1,879	38,800	5,000	6,464	2,650	41,450
Total	3.870,000	80,000.000	55.500,000	71,757,575	29.415,000	109,415,000

The sources of the production of gold and silver in the United States, compiled from the reports made by mint officers and agents, are given in the following table:

DISTRIBUTION OF THE GOLD AND SILVER PRODUCT OF THE UNITED STATES FOR THE CALENDAR YEAR 1902 AS TO SOURCES OF PRODUCTION.

[As reported by mint officers and agents.]

State or Territory.	Gold.		Silver.		
	Quartz.	Placer.	Quartz.	Lead ores.	Copper ores.
	Fine ounces.	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*
Alabama	117	25	95		
Alaska	124,156	276,554	89,388		
Arizona	199,140	2,100	1,837,000	203,000	1,130,000
California	612,559	205,478	168,582	285,917	22,257
Colorado	1,348,046	31,444	3,476,192	[a] 12,324,766	
Georgia	4,130	1,035	581		
Idaho	38,500	34,547	713,786	5,228,928	
Maryland	94	37	3		
Michigan					110,844
Montana	191,229	21,626	4,160,284	410,738	9,058,715
Nevada	144,211	757	3,516,259	482,124	
New Mexico	12,297	6,312	178,390	47,929	54,171
North Carolina	3,727	803			23,368
Oregon	77,086	11,798	107,463	2,000	
South Carolina	7,257	226	580		
South Dakota	345,715		351,000		
Tennessee		7	1		
Texas			446,166		
Utah	192,157		1,568,227	8,700,218	2,409,592
Virginia	181	27			1,344
Washington	15,115	3,000	369,450	350,000	2,000
Wyoming		2,188	5,200		
Total	3,315,717	597,964	16,988,647	28,035,620	12,812,291

[a] Lead and copper ores.

As seen from the foregoing table, Alaska furnishes nearly one-half of all the placer gold and California more then one-fourth; nearly two-thirds of Alaska gold is placer gold; placer mining is of considerable relative importance in Idaho and Oregon. On the whole, however, quartz mining predominates in the United States.

With regard to silver, on the contrary, quartz mining occupies, on the whole, the second place. Of the main silver-producing States and Territories, only Arizona, Nevada, New Mexico, South Dakota, and Oregon show a preponderance of quartz mining; copper mining as a source of silver production predominates only in Montana.

The first place is held by the product from lead ores. In the table next below the results of the year 1902 are compared with those of former years. As seen from this table, the distribution of the silver product among the several sources of production showed a slight change in 1902 as compared with 1901.

DISTRIBUTION OF THE SILVER PRODUCT OF THE UNITED STATES AS TO THE SOURCES OF PRODUCTION.

Source.	1891.	1897.	1898.	1899.	1900.	1901.	1902.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Quartz mills	49.2	21.8	24.7	28.0	27.4	27.8	29.4
Lead bullion	40.6	57.5	56.2	51.1	50.8	46.7	48.5
Copper bullion	10.2	20.7	19.1	20.9	21.8	25.5	22.1
Total	100	100	100	100	100	100	100

The annual production of gold and silver from the mines of the United States since 1860 is shown in the following table:

(The commercial value of the silver product is reckoned at the average yearly market price of silver and its coining value in United Seates dollars.)

PRODUCT OF GOLD AND SILVER FROM MINES IN THE UNITED STATES SINCE 1860.

[The estimate for 1860–1872 is by R. W. Raymond, commissioner, and since 1872 by the Bureau of the Mint.]

Calendar year.	Gold.		Silver.		
	Fine ounces.	Value.	Fine ounces.	Commercial value.	Coining value.
1860	2, 225, 250	$46, 000, 000	116, 015	$157, 000	$150, 000
1861	2, 080, 125	43, 000, 000	1, 546, 875	2, 062, 000	2, 000, 000
1862	1, 896, 300	39, 200, 000	3, 480, 469	4, 685, 000	4, 500, 000
1863	1, 935, 000	40, 000, 000	6, 574, 219	8, 842, 000	8, 500, 000
1864	2, 230, 088	46, 100, 000	8, 507, 812	11, 443, 000	11, 000, 000
1865	2, 574, 759	53, 225, 000	8, 701, 171	11, 642, 000	11, 250, 000
1866	2, 588, 063	53, 500, 000	7, 734, 375	10, 356, 000	10, 000, 000
1867	2, 502, 197	51, 725, 000	10, 441, 406	13, 866, 000	13, 500, 000
1868	2, 322, 000	48, 000, 000	9, 281, 250	12, 307, 000	12, 000, 000
1869	2, 394, 563	49, 500, 000	9, 281, 250	12, 298, 000	12, 000, 000
1870	2, 418, 750	50, 000, 000	12, 375, 000	16, 734, 000	16, 000, 000
1871	2, 104, 313	43, 500, 000	17, 789, 062	23, 578, 000	23, 000, 000
1872	1, 741, 500	36, 000, 000	22, 236, 328	29, 396, 000	28, 750, 000
Total	29, 012, 908	599, 750, 000	118, 065, 232	157, 366, 000	152, 650, 000
1873	1, 741, 500	36, 000, 000	27, 650, 000	35, 890, 000	35, 750, 000
1874	1, 620, 563	33, 500, 000	28, 849, 000	36, 869, 000	37, 300, 000
1875	1, 615, 725	33, 400, 000	24, 518, 000	30, 549, 000	31, 700, 000
1876	1, 930, 162	39, 900, 000	30, 009, 000	34, 690, 000	38, 800, 000
1877	2, 268, 788	46, 900, 000	30, 783, 000	36, 970, 000	39, 800, 000
1878	2, 476, 800	51, 200, 000	34, 960, 000	40, 270, 000	45, 200, 000
1879	1, 881, 787	38, 900, 000	31, 550, 000	35, 430, 000	40, 800, 000
1880	1, 741, 500	36, 000, 000	30, 320, 000	34, 720, 000	39, 200, 000
1881	1, 678, 612	34, 700, 000	33, 260, 000	37, 850, 000	43, 000, 000
1882	1, 572, 187	32, 500, 000	36, 200, 000	41, 120, 000	46, 800, 000
1883	1, 451, 250	30, 000, 000	35, 730, 000	39, 660, 000	46, 200, 000
1884	1, 489, 950	30, 800, 000	37, 800, 000	42, 070, 000	48, 800, 000
1885	1, 538, 325	31, 800, 000	39, 910, 000	42, 500, 000	51, 600, 000
1886	1, 693, 125	35, 000, 000	39, 440, 000	39, 230, 000	51, 000, 000
1887	1, 596, 375	33, 000, 000	41, 260, 000	40, 410, 000	53, 350, 000
1888	1, 604, 841	33, 175, 000	45, 780, 000	43, 020, 000	59, 195, 000
1889	1, 587, 000	32, 800, 000	50, 000, 000	46, 750, 000	64, 646, 000
1890	1, 588, 880	32, 845, 000	54, 500, 000	57, 225, 000	70, 465, 000
1891	1, 604, 841	33, 175, 000	58, 330, 000	57, 630, 000	75, 417, 000
1892	1, 596, 375	33, 000, 000	63, 500, 000	55, 563, 000	82, 101, 000
1893	1, 739, 323	35, 955, 000	60, 000, 000	46, 800, 000	77, 576, 000
1894	1, 910, 813	39, 500, 000	49, 500, 000	31, 422, 000	64, 000, 000
1895	2, 254, 760	46, 610, 000	55, 727, 000	36, 445, 000	72, 051, 000
1896	2, 568, 132	53, 088, 000	58, 835, 000	39, 655, 000	76, 069, 000
1897	2, 774, 935	57, 363, 000	53, 860, 000	32, 316, 000	69, 637, 000
1898	3, 118, 398	64, 463, 000	54, 438, 000	32, 118, 000	70, 384, 000
1899	3, 437, 210	71, 053, 000	54, 764, 000	32, 859, 000	70, 806, 000
1900	3, 829, 897	79, 171, 000	57, 647, 000	35, 741, 000	74, 533, 000
1901	3, 805, 500	78, 666, 700	55, 214, 000	33, 128, 000	71, 387, 000
1902	3, 870, 000	80, 000, 000	55, 500, 000	29, 415, 000	71, 758, 000
Total	63, 587, 554	1, 314, 464, 700	1, 329, 834, 000	1, 178, 315, 000	1, 719, 325, 000
Grand total	92, 600, 462	1, 914, 214, 700	1, 447, 899, 232	1, 335, 681, 000	1, 871, 975, 000

Tables showing the product of gold and silver from mines of the United States since 1792 will be found in the appendix.

DEPOSITS OF GOLD.

The deposits of gold at the mints and assay offices during the calendar year 1902 contained 6,150,511 fine ounces of the value of $127,142,337, a decrease in value of 9,715,849 from the amount reported for 1901.

Domestic gold deposited contained 4,626,578 fine ounces of the value of $95,639,848.

Domestic gold coin deposited and transfers of mutilated and uncurrent domestic gold coin from the Treasury contained 55,013 fine ounces of the value of $1,137,227.

Foreign gold bullion deposited contained 158,168 fine ounces of refined bullion valued at $3,268,967, and 669,798 fine ounces of unrefined bullion of the value of $13,845,945, a total value of $7,114,912 as shown by the following table:

Country of production.	Refined bullion.		Unrefined bullion.	
	Fine ounces.	Value.	Fine ounces.	Value.
Great Britain	143,603	$2,968,549		
British Columbia			49,414	$1,021,486
Northwest Territory			340,335	7,035,276
Ontario and Quebec			14,462	298,936
Nova Scotia			27,183	561,917
West Indies			86	1,813
Mexico	14,128	292,047	154,601	3,195,902
Central America	115	2,380	30,608	632,737
South America	322	5,991	53,095	1,097,570
China			11	236
South Africa			3	72
Total	158,168	3,268,967	669,798	13,845,945

Foreign gold coin deposited contained 433,452 fine ounces, of the value of $8,960,253, as shown by the following statement:

Country of coinage.	Fine ounces.	Value.
Great Britain	377,452	$7,802,633
France	102	2,104
Germany	1,982	40,990
Russia	1,922	39,737
Mexico	26,782	553,622
Spain	131	2,702
South America	51	1,059
Central America	239	4,931
Unknown	24,791	512,475
Total	433,452	8,960,253

Old jewelry deposited contained 207,533 fine ounces, of the value of $4,290,096.

DEPOSITS OF SILVER.

The deposits of silver during the calendar year 1902 amounted to 6,640,542 fine ounces, of the coining value of $8,585,751, an increase of $1,099,458 over the deposits reported for the year 1901.

Domestic silver deposited contained 2,564,219 fine ounces, of the coining value of $3,315,354.

Domestic silver coin deposited and transfers of mutilated and uncurrent silver coin from the Treasury contained 2,290,369, fine ounces of the coining value of $3,166,227 in subsidiary coin.

Foreign silver bullion deposits consisted of crude bullion and contained 1,114,446 fine ounces, of the value of $1,440,888, as shown by the following table:

Country of production.	Fine ounces.	Coining value.
British Columbia	14,811	$19,149
Northwest Territory	81,080	104,831
Ontario and Quebec	3,771	4,876
Nova Scotia	1,541	1,992
Mexico	918,749	1,187,866
West Indies	2	2
Central America	46,299	59,862
South America	48,193	62,310
Total	1,114,446	1,440,888

Foreign silver coin deposits amounted to 32,809 fine ounces, of the coining value of $42,419, as shown by the following table:

Country of production.	Fine ounces.	Coining value.
Mexico	355	$459
Central America	10,485	13,556
South America	4,193	5,421
Spain	99	128
West Indies (Porto Rico)	175	226
China	59	76
Unknown	17,443	22,553
Total	32,809	42,419

Old jewelry and plate deposited contained 638,707 fine ounces, of the coining value of $825,803.

DEPOSITS OF GOLD AND SILVER SINCE 1880.

The following table shows the amount of gold and silver received at the mints and assay offices by calendar years since 1880:

GOLD AND SILVER (EXCLUDING REDEPOSITS) RECEIVED AT THE MINTS AND ASSAY OFFICES DURING THE CALENDAR YEARS SINCE 1880.

Calendar year.	Gold.	Silver (coining value).	Total.
1880	$100,278,703	$35,103,825	$135,382,528
1881	98,763,426	30,326,848	129,090,274
1882	41,921,263	35,161,254	77,082,517
1883	51,089,456	36,978,184	88,067,640
1884	50,518,179	36,670,731	87,188,910
1885	44,714,052	35,836,725	80,550,777
1886	66,422,088	39,086,070	105,508,158
1887	74,724,077	46,381,333	121,105,410
1888	41,496,410	41,323,973	82,820,383
1889	42,599,206	41,977,265	84,576,471
1890	48,767,964	55,198,037	103,966,001
1891	60,849,552	70,994,120	131,843,672
1892	45,406,646	84,591,898	129,998,544
1893	69,419,223	62,465,005	131,884,228
1894	49,704,902	14,120,605	63,825,507
1895	69,433,579	13,843,636	83,277,215
1896	91,743,670	10,873,160	102,616,830
1897	87,924,232	12,707,128	100,631,360
1898	182,996,602	15,841,222	198,837,824
1899	129,798,782	13,481,927	143,280,511
1900	158,060,258	16,005,626	174,065,884
1901	136,858,186	7,486,293	144,344,479
1902	127,142,337	8,585,751	135,728,088

COINAGE OF THE UNITED STATES.

The following table exhibits the number of fine ounces and value of gold and silver coinage of the United States by calendar years since 1873:

COINAGE OF GOLD AND SILVER OF THE MINTS OF THE UNITED STATES SINCE 1873.

Calendar years.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
1873	2,758,475	$57,022,748	3,112,891	$4,024,748
1874	1,705,441	35,254,630	5,299,421	6,851,777
1875	1,594,050	32,951,940	11,870,635	15,347,893
1876	2,253,281	46,579,453	18,951,777	24,503,308
1877	2,128,493	43,999,864	21,960,246	28,393,045
1878	2,408,400	49,786,052	22,057,548	28,518,850
1879	1,890,499	39,080,080	21,323,498	27,569,776
1880	3,014,163	62,308,279	21,201,232	27,411,694
1881	4,685,162	96,850,890	21,609,970	27,940,164
1882	3,187,317	65,887,685	21,635,469	27,973,132
1883	1,414,581	29,241,990	22,620,701	29,246,968
1884	1,160,601	23,991,756	22,069,935	28,534,866
1885	1,343,519	27,773,012	22,400,433	28,962,176
1886	1,400,240	28,945,542	24,817,064	32,086,709
1887	1,159,664	23,972,383	27,218,101	35,191,081
1888	1,518,046	31,380,808	25,543,242	33,025,606
1889	1,035,899	21,413,931	27,454,465	35,496,683
1890	990,100	20,467,182	30,320,999	39,202,908
1891	1,413,614	29,222,005	21,284,115	27,518,857
1892	1,682,832	34,787,223	9,777,084	12,641,078
1893	2,757,231	56,997,020	6,808,413	8,802,797
1894	3,848,045	79,546,160	7,115,896	9,200,351
1895	2,883,941	59,616,358	4,407,055	5,698,010
1896	2,276,192	47,053,060	17,858,594	23,089,899
1897	3,677,878	76,028,485	14,298,769	18,487,297
1898	3,772,561	77,985,757	17,815,385	23,034,033
1899	5,386,277	111,344,220	20,156,957	26,061,520
1900	4,802,328	99,272,942	28,072,162	36,295,321
1901	4,921,439	101,735,188	23,851,621	30,838,461
1902	2,282,571	47,184,932	23,224,910	30,028,167
Total	75,352,840	1,557,681,575	566,138,588	731,977,175

The coinage manufactured during the calendar year 1902 by the United States mints was 196,005,925 pieces, of the value of $79,660,895.87, as follows:

Denominations.	Pieces.	Value.
Gold	3,657,267	$47,184,932.50
Silver dollars	18,160,777	18,160,777.00
Subsidiary	55,330,580	11,867,390.20
Minor	118,857,301	2,447,796.17
Total	196,005,925	79,660,895.87

Tables will be found in the appendix showing the value of the coinage made at each mint annually since 1792.

FOREIGN COINAGE.

In addition to our own coinage, the United States mints made the following silver coinage:

For the Government of Venezuela, 300,000 5-bolivar pieces and 250,000 2-boliver pieces, of the value of $392,777.79 in United States subsidiary coin.

For the Government of Colombia, 960,000 50-centavo pieces and 400,000 5-centavo pieces, of the value of $460,133.34 in United States subsidiary coin.

PURCHASE OF SILVER.

The repeal of the purchasing clause of the act of July 14, 1890, by act of November 1, 1893, limited the purchase of silver to that contained in deposits of gold bullion, silver fractions for return in fine bars, the amount retained in payment for charges on silver deposits, surplus bullion returned by the operative officers on the annual settlement at the close of the fiscal year, and uncurrent and mutilated domestic coins purchased under provisions of section 3526 of the Revised Statutes for the subsidiary silver coinage.

The following tables show the quantity and cost of silver purchased for the susidiary coinage during the calendar year 1902:

SILVER PURCHASED AT THE MINTS AND THE NEW YORK ASSAY OFFICE FOR SUBSIDIARY COINAGE DURING THE CALENDAR YEAR 1902.

Stock.	Standard ounces.	Cost.
Partings, charges, fractions, purchased	596,351.46	$279,561.70
Porto Rican coins redeemed and melted	194.31	148.50
Melted assay coins purchased	681.08	807.35
Mutilated coins purchased	2,177.12	1,018.43
Surplus bullion purchased	19,628.63	10,643.83
Total	619,032.60	292,179.81

AMOUNT, COST, AVERAGE PRICE, AND BULLION VALUE OF THE SILVER DOLLAR OF SILVER PURCHASED UNDER THE ACTS OF FEBRUARY 12, 1873, JANUARY 14, 1875, FEBRUARY 28, 1878, AND JULY 14, 1890.

Act authorizing.	Fine ounces.	Cost.	Average price per fine ounce.	Bullion cost of a silver dollar.
February 12, 1873	5,434,282.00	$7,152,564.00	$1.3162	$1.0180
January 14, 1875	31,603,906.00	37,571,148.00	1.1888	.9194
February 28, 1878	291,272,018.56	308,279,260.71	1.0583	.8185
July 14, 1890	168,674,682.53	155,931,002.25	.9244	.7150
Total	496,984,889.09	508,933,974.96	1.0240	.7920

QUANTITY AND COST OF SILVER BULLION PURCHASED UNDER ACT OF JULY 14, 1890, AND USED IN THE COINAGE OF STANDARD SILVER DOLLARS AND SUBSIDIARY SILVER, WASTED AND SOLD IN SWEEPS, NUMBER OF DOLLARS COINED, AND SEIGNIORAGE ON SAME, FROM AUGUST 13, 1890, TO DECEMBER 31, 1902.

Disposition.	Fine ounces.	Cost.
Total amount purchased and cost of same	168,674,682.53	$155,931,002.25
Used in coinage of standard silver dollars to Dec. 31, 1902	129,837,680.34	120,786,811.85
Used in coinage of subsidiary silver to Dec. 31, 1902	13,097,025.06	11,849,783.89
Wasted and sold in sweeps	63,570.37	62,535.64
Transferred to subsidiary silver purchase account	.31	.25
Total amount used	142,998,276.08	132,699,131.63
Balance on hand Dec. 31, 1902	25,676,406.45	23,231,870.62
Total	168,674,682.53	155,931,002.25

	Coinage.	Seigniorage.
Standard silver dollars coined to Dec. 31, 1902	167,870,940.00	47,084,128.15
Subsidiary silver coined to Dec. 31, 1902	18,105,443.30	6,255,659.41

Balances of Silver Bullion Purchased under Act of July 14, 1890, on Hand at Each Mint and the Assay Office at New York, January 1, 1903.

Institution.	Fine ounces.	Cost.
Mint at Philadelphia	16,066,876.09	$14,537,221.08
Mint at San Francisco	1,022,283.00	924,955.52
Mint at New Orleans	8,420,235.24	7,618,582.32
Assay office at New York	167,012.12	151,111.70
Total	25,676,406.45	23,231,870.62

Balances of Silver Bullion.

Items.	Standard ounces.	Cost.
Purchased under act of July 14, 1890	28,529,340.50	$23,231,870.62
For subsidiary silver coinage at mints and assay offices	1,369,087.38	797,512.97
At United States assay office in New York for payment of deposits in fine bars	95,401.91	95,401.91
Total	29,993,829.79	24,124,785.50

IMPORTS AND EXPORTS OF GOLD AND SILVER.

IMPORTS OF GOLD.

The value of gold imported into the United States during the calendar year 1902 was $44,193,317, against $54,761,880 for the calendar year 1901, a decrease of $10,568,563. The value of gold bullion imported was $11,432,320, of which amount $5,188,896 came from Mexico; $2,858,838 from Great Britain; $1,677,691 from Canada; $736,782 from Central American States; $950,269 from South American States, and the remainder from various countries.

Foreign gold coin of the value of $9,648,269 was also imported, of which $7,791,277 came from Australasia; $1,447,500 from France; $236,433 from Canada; $99,049 from West Indies, and the remainder from various countries.

The value of gold contained in ore and base bullion imported was $21,482,360, of which $17,182,384 came from Canada; $3,912,642 from Mexico; $307,287 from South America; $9,289 from Japan; $13,083 from Korea; $1,000 from Cuba; $100 from Great Britain, and $56,575 from Central America.

There were returned to the United States gold coins of the value of $1,630,368, of which $584,470 came from Canada; $355,178 from Mexico; $54,459 from South America; $364,872 from West Indies; $93,097 from France; $91,600 from China, and the remainder from various countries.

Gold Imports, Calendar Year 1902.

Description.	Amount.
Foreign bullion (refined)	$11,432,320
Foreign coin	9,648,269
Gold in ore and base bullion	21,482,360
Total foreign	42,562,949
United States coin	1,630,368
Total gold imports	44,193,317

GOLD EXPORTS.

The total value of gold exported from the United States during the calendar year 1902 was $36,030,591, against $57,783,939 for the calendar year 1901, a decrease of $21,753,348.

Of the gold exported $34,106,874 was domestic and $1,923,717 was foreign.

The value of United States assay office bars exported was $22,563,129, of which amount $18,767,031 went to France and $3,796,098 to Germany. Other domestic bullion was exported to the value of $2,518,430, of which amount $2,479,002 went to Japan and Hongkong and $39,428 to Canada.

The value of domestic gold coin exported was $8,881,295, of which amount $3,604,299 went to Canada, $86,300 to Central America, $55,100 to Mexico, $379,140 to the West Indies, $3,370,314 to South America, $1,125,000 to Germany, and the remainder to various countries.

The value of gold in domestic ores and copper matte exported was $144,020, of which amount $112,270 went to Canada, $26,500 to Germany, and $5,250 to Great Britain.

Foreign gold coin of the value of $1,591,258 was exported, of which amount $1,334,543 went to the West Indies and Brazil and the remainder to various countries.

Foreign gold bullion to the amount of $168,723 was exported, of which $144,025 went to Great Britain and $24,698 to Canada.

Foreign gold ore and base bullion to the value of $163,736 was exported, of which amount $131,486 went to Canada, $32,000 to France, and $250 to Great Britain.

Gold Exports, Calendar Year 1902.

Description.		Amount.
United States assay office bars		$22,563,129
Other bullion		2,518,430
United States coin		8,881,295
Gold ore and base bullion		144,020
Total domestic		34,106,874
Foreign bullion reexported	$168,723	
Foreign coin reexported	1,591,258	
Foreign ore and base bullion reexported	163,736	
		1,923,717
Total gold exports		36,030,591

SILVER IMPORTS.

The silver imports into the United States from all sources during the calendar year 1902, aggregated $26,402,935, against $31,146,782 imported during the previous year, a decrease of $4,743,847.

The commercial value of foreign silver bullion imported was $5,207,577, of which amount $4,752,238 came from Mexico, $392,857 from Central America, $45,092 from South America, $15,894 from Canada, $1,354 from Great Britain, and $142 from France.

Silver coins of the United States of the value of $541,197 were returned to the country, of which amount $312,040 came from Canada, $59,906 from the West Indies, $153,000 from Philippine Islands, and the remainder from various countries.

Foreign silver coins of the value of $2,753,840 were also imported, of which $2,337,450 came from Mexico, $358,435 from Central America, $41,192 from the West Indies, and the remainder from various countries.

Foreign silver ore and base bullion imported contained $17,900,321, of which amount $15,053,864 came from Mexico, $1,947,864 from Canada, $892,158 from South America, and $6,435 from Honduras.

Silver Imports, Calendar Year 1902.

Description.	Amount.
Foreign bullion	$5,207,577
Foreign coin	2,753,840
Silver in ore and base bullion	17,900,321
Total foreign	25,861,738
United States coin	541,197
Total silver imports	26,402,935

SILVER EXPORTS.

The value of silver exported during the calendar year 1902 amounted to $49,272,954, against $55,638,358 during the calendar year 1901, showing a decrease of $6,365,404. The domestic exports amounted to $45,379,134, and the foreign to $3,893,820.

Of the domestic exports of silver bullion $33,775,693 went to Great Britain, $5,803,238 to Hongkong, $1,426,340 to British East Indies, $2,614,306 to Mexico, $1,150,741 to France, and the remainder to various countries.

The value of silver in domestic ores and base bullion exported was $43,940, of which $25,925 went to Canada, $15,465 to Great Britain, and $2,550 to Germany.

There was exported domestic silver coin amounting to $184,867, of which $142,623 went to the West Indies, $3,100 to South America, $36,860 to Canada, $1,000 to Great Britain, $900 to Germany, and $384 to Italy.

Foreign silver coin amounting to $3,892,584 was exported, of which $347,000 went to Great Britain, $2,495,084 to Hongkong, $135,329 to Canada, $130,458 to Mexico, $39,201 to the West Indies, 383,285 to South America, $92,000 to China, $224,706 to Philippine Islands, and the remainder to various countries. Foreign silver bullion valued at $525 was exported to Great Britain.

Foreign silver ore and base bullion valued at $711 was exported to Great Britain.

Silver Exports, Calendar Year 1902.

Description.		Amount.
Silver bullion		$45,150,327
United States coin		184,867
Silver in ore and base bullion		43,940
Total domestic		45,379,134
Foreign bullion reexported	$525	
Foreign coin reexported	3,892,584	
Silver in ore and base bullion	711	
		3,893,820
Total silver exports		49,272,954

In the Appendix will be found tables exhibiting the imports and exports of the precious metals, by customs districts and by countries, for the calendar year 1902, compiled and kindly furnished by the Bureau of Statistics, for use in this report.

MOVEMENT OF GOLD FROM THE PORT OF NEW YORK.

The superintendent of the United States assay office at New York has kindly prepared the following tables, giving exports of gold through the port of New York during the calendar year 1902:

STATEMENT OF UNITED STATES GOLD COIN AND BULLION EXPORTED FROM THE PORT OF NEW YORK TO EUROPE DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1902.

Date.	Country.	Amount.	Rate of exchange.
1902.			
January 3	Germany	$603,650	$4.87
Do	England	142,320	4.87
January 10	Germany	525,000	4.87¼
January 20	France	461,114	4.87¼
February 5	do	4,265,979	4.87¼
Do	England	800	4.87¼
February 26	France	3,514,510	4.87¾
March 5	do	2,007,188	4.87¾
March 7	do	1,816,538	4.87¾
April 7	do	2,518,689	4.87¾
April 23	do	150	4.87¾
April 29	England	39,600	4.87
May	do	420	
Do	Germany	5,550	
June 17	England	1,860	4.87½
Do	Germany	5,000	
July 21	do	907,348	4.87¾
July 23	France	1,748,779	4.88
July 28	do	1,788,450	4.88
Do	Germany	1,908,205	4.88
July 30	France	1,106,723	4.88
August 6	Germany	519,445	4.88
Do	do	3,800	
September	do	4,200	
October	do	4,300	
Total		23,899,618	

RECAPITULATION OF GOLD EXPORTS TO EUROPE.

Description.	England.	France.	Germany.	Grand total.
United States coin	$39,600	$150	$1,125,000	
Foreign coin		7,334	5,900	
United States assay office bars		19,224,859	3,334,998	
Bullion	144,023	35,284		
In ore	1,375	14,200	12,300	
Total	184,998	19,281,827	4,478,198	$23,945,023

During the same period there were shipped to West Indies, Mexico, Central and South America the following, viz:

United States coin	$3,802,454	
Foreign coin	846,225	
Total		4,648,679
Grand total of exports		28,593,702

The imports of gold during the same period were as follows, viz:

From Europe:		
Foreign coin	$971, 397	
Bullion	2, 858, 845	
In ore	100	
Total		$3, 830, 342
From Mexico, West Indies, Central and South America:		
United States coin	575, 613	
Foreign coin	638, 212	
Bullion	1, 209, 386	
In ore and base bullion	601, 890	
Total		3, 025, 101
Grand total of imports		6, 855, 443

IMPORTS AND EXPORTS OF THE PRINCIPAL COUNTRIES OF THE WORLD.

The imports and exports of the precious metals of the principal countries of the world during the calendar year 1902 are exhibited in the following table. The information relating to foreign countries was received principally through representatives of the United States in them.

IMPORTS AND EXPORTS OF THE PRECIOUS METALS IN THE PRINCIPAL COUNTRIES OF THE WORLD, 1902.

GOLD.

Country.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
United States	$44, 193, 317	$36, 030, 591	$8, 162, 726	
Africa[a]	6, 460, 483	39, 130, 204		$32, 669, 721
Argentina	8, 856, 958	3, 057, 440	5, 799, 518	
Austria-Hungary	37, 237, 476	14, 630, 556	22, 606, 920	
Brazil	3, 296, 118	2, 508, 056	788, 062	
Denmark		402, 000		402, 000
Ecuador	1, 250, 000	200, 000	1, 050, 000	
Egypt	23, 626, 972	9, 037, 841	14, 589, 131	
France	85, 060, 311	24, 518, 913	60, 541, 398	
Great Britain	108, 450, 279	74, 988, 327	33, 461, 952	
Germany	33, 077, 957	25, 233, 161	7, 844, 796	
Guiana (British)		2, 086, 891		2, 086, 891
Guiana (Dutch)	143, 615	442, 109		298, 494
India (British)[b]	42, 800, 439	14, 365, 265	28, 435, 174	
Italy	5, 605, 318	1, 502, 795	4, 102, 523	
Japan	15, 043, 541	225, 930	14, 817, 611	
Korea		2, 524, 150		2, 524, 150
Mexico[c]		9, 631, 205		9, 631, 205
Netherlands	3, 118, 344	1, 739, 961	1, 378, 383	
Norway	15, 200		15, 200	
Peru	49, 573	291, 934		242, 361
Portugal	9, 180	751, 356		742, 176
Russia				
Siam	125	30	95	
Straits Settlements	2, 646, 657	1, 337, 859	1, 308, 798	
Sweden	179		179	
Switzerland	10, 018, 040	5, 577, 152	4, 440, 888	
Spain	359, 468	47, 214	312, 254	

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[a] Annual statement of the trade of the United Kingdom with foreign countries and with British possessions.

[b] Fiscal year ended March 31.

[c] Imports gold and silver not separated, $3,457,994.

Imports and Exports of the Precious Metals in the Principal Countries of the World, 1902—Continued.

SILVER.

Country.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
United States	$26,402,935	$49,272,954	....	$22,870,019
Africa [a]	2,870,471	415,502	$2,454,969	....
Argentina	52,128	16,901	35,227	....
Austria-Hungary	3,245,501	4,738,121	....	1,492,620
Brazil	324	6,832	....	6,508
Ecuador	101,000	....	101,000	....
Egypt	296,837	44,022	252,815	....
France	18,667,732	23,085,502	....	4,417,770
Great Britain	52,757,722	52,149,988	607,734	....
Germany	5,389,510	6,830,176	....	1,440,666
Guiana (Dutch)	2,106	212,218	....	210,112
India (British) [b]	39,340,621	16,967,325	22,373,296	....
Italy	1,241,731	778,568	463,163	....
Japan	985,680	785,223	200,457	....
Mexico [c]	....	69,826,948	....	69,826,948
Netherlands	2,628,573	101,976	2,526,597	....
Norway	207,776	....	207,776	....
Persia	3,620,000	....	3,620,000	....
Peru	408	2,411,968	....	2,411,560
Portugal	423,468	406,188	17,280	....
Siam	9,621,871	755,508	8,866,363	....
Straits Settlements	31,734,342	23,554,679	8,179,663	....
Sweden	74,826	....	74,826	....
Switzerland	13,323,559	2,754,094	10,569,465	....
Spain	2,026,383	2,828,549	....	802,166

[a] Annual statement of the trade of the United Kingdom with foreign countries and with British possessions.

[b] Fiscal year ended March 31.

[c] Imports gold and silver not separated, $3,457,994.

Value of Gold and Silver Imported into and Exported from the United States from and into the United Kingdom.

GOLD BULLION AND COIN.

Calendar year.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1874	$44,261	$21,941,783	....	$21,897,522
1875	2,806,311	40.185,922	....	37,379,611
1876	17,150,938	21,274,902	....	4,123,964
1877	5,682,271	10,034,324	....	4,352,053
1878	4,032,112	4,216,010	....	183,898
1879	33,817,688	1,889,418	$31,928,270	....
1880	26,823,600	269,431	26,554,169	....
1881	35,947,633	112,859	35,834,774	....
1882	448,701	29,684,594	....	29,235,893
1883	4,562,437	47,580	4,514,857	....
1884	10,627,477	24,683,345	....	14,055,868
1885	1,456,700	530,665	926,035	....
1886	14,575,484	12,556,212	2,019,272	....
1887	8,568,758	180,110	8,388,648	....
1888	19,169	10,956,287	....	10,937,118
1889	50,125	13,608,778	....	13,558,653
1890	4,923,034	12,624,961	....	7,701,927
1891	15,391,766	37,351,283	....	21,959,517
1892	641,385	5,110,827	....	4,469,442
1893	28,796,540	20,595,062	8,201,478	....
1894	1,459,590	15,799,647	....	14,340,057
1895	16,146,069	54,173,664	....	38,027,595
1896	51,236,371	15,431,560	35,804,811	....
1897	5,881,000	331,195	5,549,805	....
1898	53,250,031	236,011	53,014,020	....
1899	6,441,786	11,577,627	....	5,135,841
1900	5,267,986	28,569,927	....	23,301,941
1901	253,301	1,283,861	....	1,030,560
1902	248,970	1,877,739	....	1,628,769
Total	356,551,494	397,135,584	212,736,139	253,320,229
Excess	....	40,584,090	....	40,584,090

VALUE OF GOLD AND SILVER IMPORTED INTO AND EXPORTED FROM THE UNITED STATES FROM AND INTO THE UNITED KINGDOM—Continued.

SILVER BULLION AND COIN.

Calendar year.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1874	$122,879	$16,918,981	....	$16,796,102
1875	43,448	15,481,341	....	15,437,893
1876	1,841,683	12,834,099	....	10,992,416
1877	1,449,682	12,730,380	....	11,280,698
1878	5,269,384	7,870,002	....	2,600,618
1879	2,989,588	12,632,115	....	9,642,527
1880	163,125	5,832,816	....	5,669,691
1881	152,531	12,644,788	....	12,492,257
1882	143,172	9,355,681	....	9,212,509
1883	236,755	13,643,442	....	13,406,687
1884	40,548	12,795,566	....	12,755,018
1885	29,253	13,648,158	....	13.618,905
1886	13,943	8,259,345	....	8,245,402
1887	172,026	10,773,185	....	10,601,159
1888	157,280	11,600,485	....	11,443,205
1889	151,591	19,348,927	....	19,197,336
1890	3,161,262	19,746,841	....	16,585,579
1891	41,755	19,387,377	....	19,345,622
1892	88,794	26,807,663	....	26,718,869
1893	14,780	35,371,119	....	35,356,339
1894	10,847	35,267,598	....	35,256,751
1895	37,054	39,335,554	....	39,298,500
1896	32,182	49,352,583	....	49,320,401
1897	70,034	49,092,031	....	49,021,997
1898	39,521	45,547,496	....	45,507,975
1899	88,994	42,929,713	....	42,840,719
1900	139,479	55,768,202	....	55,628,723
1901	350,388	47,297,479	....	46,947,091
1902	32,061	39,238,740	....	39,206,679
Total	17,084,039	701,511,707	....	684,427,668
Excess	....	684,427,668	....	....

The following table exhibits the value of gold and silver bullion and coin imported into and exported from the United States from and into France since 1879:

VALUE OF GOLD AND SILVER IMPORTED INTO AND EXPORTED FROM THE UNITED STATES FROM AND INTO FRANCE.

GOLD BULLION AND COIN.

Fiscal year.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1879	$1,230,447	$128,424	$1,102,023	....
1880	33,383,297	2,649	33,380,648	....
1881	18,219,558	450	18,219,108	....
1882	1,495,006	2,590,050	....	$1,095,044
1883	104,220	....	104,220	....
1884	3,969,915	5,015,767	....	1,045,852
1885	3,113,347	6,300	3,107,047	....
1886	4,427,555	11,578,912	....	7,151,357
1887	12,433,314	37,135	12,396,179	....
1888	9,570,658	44,166	9,526,492	....
1889	1.558,341	23,026,482	....	21,468,141
1890	2,353,761	5,431,373	....	3,077,609
1891	472,850	14,659,015	....	14,186,165
1892	15,845,817	13,061,100	2,784,717	....
1893	5,399,599	32,240,402	....	26,840,803
1894	10,742,507	15,450,000	....	4,707,493
1895	7,845,583	28,625,400	....	20,779,817
1896	3,933,491	7,534,361	....	3,600,870
1897	16,444,810	13,989,041	2,455,769	....
1898	22,799,157	4,016,535	18,782,622	....
1899	10,962,144	7,000,000	3,962,144	....
1900	638,486	14,024,240	....	13,385,754
1901	1,404,380	21,742,600	....	20,338,220
1902	1,408,997	30,133,729	....	28,724,732
Total	189,757,243	250,338,131	105,820,969	166,401,857
Excess	....	60,580,888	....	60,580,888

VALUE OF GOLD AND SILVER IMPORTED INTO AND EXPORTED FROM THE UNITED STATES FROM AND INTO FRANCE—Continued.

SILVER BULLION AND COIN.

Fiscal year.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1879	$259,097	$126,666	$132,431	
1880	24,274	89,431		$65,157
1881	1,267	75,850		74,583
1882	21,064	810,400		789,336
1883	212	1,381,214		1,381,002
1884	1,635	796,788		795,153
1885	919	830,115		829,196
1886	146,477	585,157		438,680
1887	70,139	980,713		910,574
1888	227,566	601,809		374,243
1889	1,906	371,850		369,944
1890	1,351	134,535		133,184
1891		399,684		399,684
1892	360,433	1,412,624		1,052,191
1893	1,351	462,898		461,547
1894	21,595	201,000		179,405
1895	5,126	1,500	3,626	
1896	8,133	3,435,326		3,427,193
1897	2,722	1,632,866		1,630,144
1898	24,718	1,062,250		1,037,532
1899	4,424	2,056,408		2,051,984
1900	8,288	1,021,465		1,013,177
1901	5,513	1,165,961		1,160,448
1902	837	1,050,626		1,049,789
Total	1,199,047	20,687,136	136,057	19,624,146
Excess		19,488,089		19,488,089

The following table exhibits the value of gold and silver bullion and coin imported into and exported from the United States and from and into Germany since 1879:

VALUE OF GOLD AND SILVER IMPORTED INTO AND EXPORTED FROM THE UNITED STATES FROM AND INTO GERMANY.

GOLD BULLION AND COIN.

Fiscal year.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1879		$6,600		$6,600
1880	$3,128,185	15,850	$3,112,335	
1881	31,406,112	4,157	31,401,955	
1882	4,596,964	82,560	4,514,404	
1883	2,299,665	32,600	2,267,065	
1884	3,079,605	1,115,674	1,963,931	
1885	7,938,164	57,039	7,881,125	
1886	5,921,677	3,882,799	2,038,878	
1887	12,744,269	2,000,180	10,744,089	
1888	18,265,659	6,637,241	11,628,418	
1889	1,259,139	8,709,652		7,450,513
1890	1,756,884	2,297,808		540,924
1891	2,758,812	16,530,377		13,771,565
1892	3,920,742	19,308,050		15,387,308
1893	478,811	37,913,100		37,434,289
1894	14,437,867	28,811,650		14,373,783
1895	1,376,762	14,857,754		13,480,992
1896	119,016	29,020,672		28,901,656
1897	3,554,697	18,478,682		14,923,985
1898	8,428,050	1,260,840	7,167,210	
1899	190,996	3,018,000		2,827,004
1900	12,946	4,768,189		4,755,243
1901	756,332	8,408,166		7,651,834
1902	15	8,604,368		8,604,353
Total	128,431,369	215,822,008	82,719,410	170,110,049
Excess		87,390,639		87,390,639

VALUE OF GOLD AND SILVER IMPORTED INTO AND EXPORTED FROM THE UNITED STATES FROM AND INTO GERMANY—Continued.

SILVER BULLION AND COIN.

Fiscal year.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1879	$45,399	$348,432		$303,033
1880	15,465	383,830		368,365
1881	96,231	472,029		375,798
1882	296,697	649,628		352,931
1883	271,052	335,455		64,403
1884	39,194	1,914,560		1,875,366
1885	9,538	282,609		273,071
1886	34,386	99,333		64,947
1887	177,855	83,389	$94,466	
1888	135,078	151,276		16,198
1889	19,015	575	18,440	
1890	750,633	32,712	717,921	
1891	845,901	910	844,991	
1892	91,413	107,666		16,253
1893	9,688	4,500	5,188	
1894	1,905	94,950		93,045
1895	12,328	81,317		68,989
1896	3,311	10,179		6,868
1897	12,573	17,221		4,648
1898	3,240	945	2,295	
1899	1,940	59,612		57,672
1900	5,369	17,800		12,431
1901	318	37,567		37,249
1902		2,870		2,870
Total	2,878,529	5,189,365	1,683,301	3,994,137
Excess		2,310,836		2,310,836

MARKET PRICE OF SILVER DURING THE CALENDAR YEAR 1902.

The depression which characterized the silver market during 1901 continued throughout 1902. The highest price, 26⅛d. per ounce in January, gradually declined to 24⅛, and then suddenly to $23\frac{5}{16}$, after which there was a rally to 24d., which was maintained for some time only to be followed by a further decline (November 27) to $21\frac{9}{16}$d., the lowest price ever reached.

The decline during the earlier months of 1902 might have been much more rapid but for the steady purchases for India, which continued for the first nine months of the year. The principal factor in the market was the condition of China, the balance of trade being enormously against her and the tremendous indemnity exacted by the powers making her a seller instead of a purchaser of silver.

The firmness observed in the market during the middle of the year was due to the arrangement made by the producers of the United States to supply Mexico with silver; but that country subsequently having found itself glutted with the white metal, much of it was thrown upon the market.

The demand for coinage on the part of Great Britain and France was unusually light.

The extraordinary decline in November was due to apprehensions that the silver standard was losing ground in its principal strongholds. In Mexico there was a marked sentiment in favor of the adoption of the gold standard; a similar feeling in the Straits Settlements had resulted in the appointment of a commission to consider the advisability of adopting the gold standard; France had likewise taken up the question of the currency of French Indo-China, and in Hongkong there was a strong movement on the part of a number of leading merchants in favor of the yellow metal. These facts and the enactment by Congress of certain monetary legislation for the Philippines caused the Siamese Government to adopt the gold standard forthwith. These prospects and measures naturally had a depressing influence on silver.

HIGHEST, LOWEST, AND AVERAGE PRICE OF SILVER BULLION AND VALUE OF A FINE OUNCE EACH MONTH DURING THE CALENDAR YEAR 1902.

Months.	Highest.	Lowest.	Average price per ounce, British standard, 0.925.	Equivalent value of a fine ounce with exchange at par, $4.8665.	Average monthly price at New York of exchange on London.	Equivalent value of a fine ounce based on average monthly price and average rate of exchange.	Average monthly New York price of fine bar silver.
1902.	*Pence.*	*Pence.*	*Pence.*				
January	$26\frac{1}{16}$	$25\frac{3}{8}$	25.6250	$0.56173	$4.8716	$0.56231	$0.56302
February	$25\frac{1}{2}$	$25\frac{5}{16}$	25.4140	.55711	4.8749	.55806	.55833
March	$25\frac{7}{16}$	$24\frac{13}{16}$	25.0078	.54820	4.8773	.54938	.54923
April	$24\frac{7}{8}$	$23\frac{5}{16}$	24.3221	.53316	4.8788	.53449	.53452
May	$24\frac{1}{8}$	$23\frac{5}{16}$	23.6990	.51950	4.8731	.52021	.52000
June	$24\frac{7}{16}$	$23\frac{15}{16}$	24.1850	.53016	4.8764	.53122	.53085
July	$24\frac{7}{16}$	$24\frac{3}{16}$	24.3680	.53417	4.8800	.53566	.53152
August	$24\frac{7}{16}$	$24\frac{3}{16}$	24.2259	.53106	4.8748	.53197	.53250
September	$24\frac{1}{8}$	$23\frac{9}{16}$	23.8750	.52326	4.8603	.52270	.52269
October	$23\frac{11}{16}$	$23\frac{1}{4}$	23.4004	.51296	4.8626	.51255	.51162
November	$23\frac{1}{4}$	$21\frac{11}{16}$	22.6925	.49731	4.8714	.49758	.49705
December	$22\frac{5}{8}$	$21\frac{13}{16}$	22.2067	.48679	4.8701	.48694	.48653
Total			24.0851	.52795	4.8726	.52858	.52815

EXPORTS OF SILVER TO THE EAST.

The exports of silver from London to India, China, and the Straits since 1881 have been as follows:

Calendar year.	India.	China.	Straits.	Total.
1881	$12,375,612	$3,898,860	$3,577,729	$19,852,201
1882	18,604,945	1,584,318	7,354,255	27,543,518
1883	18,040,140	4,212,574	11,189,631	33,442,345
1884	26,073,909	5,018,714	8,136,097	39,228,720
1885	30,913,667	3,160,315	3,108,146	37,182,128
1886	21,159,591	1,769,425	2,892,064	25,821,080
1887	19,798,328	1,427,179	2,766,946	23,992,453
1888	21,162,116	1,153,002	3,219,321	25,534,439
1889	28,392,786	2,731,861	8,181,141	39,305,788
1890	35,673,177	1,284,498	4,441,197	41,398,872
1891	21,717,992	1,177,620	10,754,800	33,650,412
1892	35,180,897	719,668	18,622,825	54,523,390
1893	34,319,877	11,635,650	7,847,295	53,802,822
1894	24,391,351	13,279,564	6,002,565	43,673,480
1895	17,638,610	8,042,003	3,668,772	29,349,385
1896	23,874,942	3,602,597	4,025,257	31,502,796
1897	28,250,305	2,721,522	3,597,331	34,569,158
1898	20,984,625	3,721,656	1,971,443	26,677,724
1899	25,597,912	6,929,117	1,396,223	33,923,252
1900	37,916,065	11,252,496	3,922,477	53,091,038
1901	36,987,395	4,101,764	3,150,630	44,239,789
1902	30,987,195	991,793	5,363,710	37,342,698

VALUE OF NET IMPORTS OF SILVER INTO INDIA SINCE 1835.

The net imports in value of silver into India, average exchange rate of India rupee in London, and amount of council bills sold, by fiscal years ended March 31, is shown by the following table:

Year.	Net imports of silver.	Average rate of Indian rupee.	Amount of council bills sold.	Year.	Net imports of silver.	Average rate of Indian rupee.	Amount of council bills sold.
		Pence.				*Pence.*	
1835–36	[a]16,118,960	....	$9,953,224	1869–70	$34,500,818	23¼	$33,968,764
1836–37	$6,176,311	22¾	9,938,522	1870–71	4,273,507	22⅜	41,090,337
1837–38	9,173,294	23	8,303,149	1871–72	30,574,254	23⅛	50,175,265
1838–39	12,671,392	23⅜	11,419,685	1872–73	3,298,985	22¾	67,834,606
1839–40	7,864,683	23½	7,005,448	1873–74	11,311,401	22.351	64,654,752
1840–41	6,679,118	23½	5,715,461	1874–75	20,916,698	22.221	52,760,715
1841–42	5,887,052	22⅝	12,600,746	1875–76	6,826,414	21.645	60,291,052
1842–43	14,068,739	23½	5,827,332	1876–77	29,911,149	20.491	61,784,106
1843–44	17,237,334	23	13,634,624	1877–78	61,869,640	20.79	49,319,325
1844–45	8,719,684	21⅝	12,248,742	1878–79	15,910,390	19.761	67,880,692
1845–46	4,112,529	21¾	14,919,273	1879–80	31,852,848	19.961	74,271,598
1846–47	6,322,979	22⅝	15,071,750	1880–81	15,751,280	19.956	74,163,888
1847–48	2,204,565	22	7,503,189	1881–82	21,699,764	19.895	89,604,086
1848–49	1,344,618	21⅛	9,193,767	1882–83	29,614,971	19.525	73,584,015
1849–50	5,810,633	22½	14,283,752	1883–84	25,372,923	19.536	85,649,451
1850–51	10,410,803	24¼	15,750,223	1884–85	28,367,364	19.308	66,957,731
1851–52	14,016,886	24⅛	13,516,816	1885–86	42,960,530	18.254	50,089,386
1852–53	22,293,629	23⅞	16,152,235	1886–87	25,306,454	17.441	59,061,202
1853–54	11,279,345	24⅛	18,738,775	1887–88	31,623,459	16.899	74,742,515
1854–55	138,797	23⅛	17,860,191	1888–89	30,709,917	16.379	69,410,203
1855–56	40,085,623	24⅛	7,222,081	1889–90	36,741,437	16.566	75,306,635
1856–57	56,413,954	25⅛	13,722,119	1890–91	51,993,287	18.089	77,713,304
1857–58	61,012,039	24⅝	3,059,077	1891–92	30,611,949	16.733	78,320,740
1858–59	[a]77,283,420	([b])	124,451	1892–93	39,083,615	14.984	80,454,024
1859–60	[a]111,475,630	([b])	22,843	1893–94	40,466,665	14.546	46,378,884
1860–61	[a]53,280,090	([b])	3,879	1894–95	16,812,318	13.100	82,268,679
1861–62	$43,988,930	23⅞	5,809,277	1895–96	18,206,409	13.641	85,278,507
1862–63	60,757,238	23⅞	32,321;230	1896–97	17,163,165	14.454	76,028,915
1863–64	61,950,883	23⅞	43,698,839	1897–98	26,447,429	15.393	44,271,918
1864–65	48,793,010	23⅞	33,040,970	1898–99	16,442,585	15.979	91,061,157
1865–66	89,904,731	23¾	33,900,604	1899–1900	11,653,240	16.068	92,495,079
1866–67 [c]	32,474,026	23	24,661,422	1900–1901	30,792,023	15.973	65,501,810
1867–68	26,230,510	23⅛	20,134,097	1901–2	23,318,450	15.988	89,444,377
1868–69	40,330,842	23⅛	18,033,989	1902–3	22,373,295	16.0018	90,029,987

[a] Rupees.

[b] From 1858–59 to 1860–61, inclusive, the home treasury was open at all times for the sale of bills on India, at rates altered from time to time by advertisement. Consequent on the mutiny, it was necessary to refrain from drawing on India, and exchange was raised to a prohibitory rate.

[c] Eleven months.

GOLD AND SILVER IMPORTED INTO AND EXPORTED FROM BRITISH INDIA IN EACH FISCAL YEAR ENDING MARCH 31, FROM 1873–74 (BRITISH STANDARD OUNCES).

[From Financial and Commercial Statistics of British India.]

Period.	Gold.			Silver.		
	Imported.	Exported.	Net imports.	Imported.	Exported.	Net imports.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*
1873–74	....	....	331,554	....	....	8,747,151
1874–75	....	....	446,964	....	....	16,269,590
1875–76	....	....	355,985	....	....	5,451,074
1876–77	....	....	62,696	....	....	25,229,986
1877–78	....	....	102,628	....	....	51,436,354
1878–79	....	....	177,101	....	....	13,916,146
1879–80	....	....	374,227	....	....	27,581,194
1880–81	....	....	777,533	....	....	13,642,358
1881–82	....	....	1,028,240	....	....	18,852,031
1882–83	....	....	1,048,810	....	....	26,216,055
1883–84	....	....	1,138,584	....	....	22,448,221
1884–85	....	....	973,053	....	....	25,393,863
1885–86	....	....	544,437	....	....	40,677,913
1886–87	....	....	393,174	....	....	25,078,814

Gold and Silver Imported into and Exported from British India in Each Fiscal Year ending March 31, from 1873–74 (British Standard Ounces)—Continued.

Periods.	Gold.			Silver.		
	Imported.	Exported.	Net imports.	Imported.	Exported.	Net imports.
	Ounces.	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*	*Ounces.*
1887–88	569,684	41,646	528,038	37,877,141	5,094,542	32,782,599
1888–89	512,287	50,710	461,577	37,844,665	5,408,636	32,436,029
1889–90	850,232	76,848	773,384	43,940,659	5,296,885	38,643,774
1890–91	1,175,875	161,646	1,014,229	56,190,870	4,661,785	51,529,085
1891–92	709,102	285,454	423,648	38,177,580	5,829,142	32,348,438
1892–93	272,442	726,925	−454,483	54,180,144	8,656,632	45,523,512
1893–94	474,635	378,399	96,236	60,328,296	5,999,323	54,328,973
1894–95	236,873	926,843	−689,970	32,638,069	5,598,047	27,040,022
1895–96	695,055	372,432	322,623	34,082,810	7,064,731	27,018,079
1896–97	657,238	347,873	309,365	37,520,322	11,591,234	25,929,088
1897–98	1,129,149	397,114	732,035	68,535,612	24,250,995	44,284,617
1898–99	1,432,461	410,461	1,022,000	49,226,780	26,061,355	23,165,425
1899–1900	1,914,037	353,225	1,560,812	50,663,542	32,017,260	18,646,282
1900–1901	1,987,738	1,881,060	106,678	64,746,549	15,311,385	49,435,164
1901–2	1,372,249	1,097,743	274,506	66,726,972	27,721,780	39,205,192
1902–3	2,187,384	770,766	1,416,618	75,167,077	32,294,876	42,872,201

Note.—The quantities in the column "net imports" for both gold and silver, for the years 1873–74 to 1886–87 are estimated only, deduced from the declared values of the trade for those years by the following process:

For gold, the rupee value of the monthly net imports was converted into sterling at the average rate of exchange in each month, and this sterling value was then divided by the English mint price of gold (£3 17s. 10½d.). For silver the average price of 107 rupees per 100 tolas, or 285.33 rupees per 100 ounces, was taken as the basis of the value of the annual imports.

IMPORTS AND EXPORTS OF BULLION INTO AND FROM LONDON.

The imports and exports of bullion into and from various countries during the calendar year 1902, were as follows:

Countries.	Imports.		Exports.	
	Gold.	Silver.	Gold.	Silver.
Belgium	$1,916,199	$216,408	$487	....
France	1,666,105	2,137,849	10,733,927	$5,237,541
Germany	394,104	1,495,466	3,337,830	1,714,916
Holland	5,025,279	78,287	97,330	90,536
Sweden and Denmark	....	....	486,650	4,185
Russia	....	....	462	1,227,808
Spain, Portugal, etc	1,021,965	169,150	....	192,855
Gibraltar	51,410	6,351	....	1,134
Malta	13,383	3,504	1,618,598	122,636
Alexandria	4,215,878	129,283	....	....
Egypt	....	....	4,918,061	253,223
Aden Mauritius Ceylon Bombay Madras Calcutta Singapore Penang Manila	15,635,300	2,141	9,845,066	34,430,342
Hongkong and Shanghai	555,779	219,727	....	2,386,215
Japan	1,752	....	7,689,070	226,292
Cape Verde, Sierra Leone, etc	457,568	411,969	217,401	2,086,809
Natal, Transvaal, Cape of Good Hope	38,672,606	3,533	6,243,082	811,888
United States	248,970	39,238,740	1,877,739	32,061
Mexico, South America (except Brazil), West Indies, etc	5,415,076	1,992,754	12,514,482	413,531
Brazil	2,013,334	691	3,494,804	....
British North America	....	....	....	371,484
Australia	23,721,161	1,142,971	487	430,685
New Zealand	2,861,361	222,380	....	....
Other countries	1,370,552	46,743	11,912,851	2,115,847
Total	105,257,782	47,517,947	74,988,327	52,149,988

STOCK OF MONEY IN THE UNITED STATES.

On December 31, 1902, the stock of domestic coin in the United States was as follows:

OFFICIAL TABLE OF STOCK OF COIN IN THE UNITED STATES DECEMBER 31, 1902.

Items.	Gold.	Silver.	Total.
Estimated stock of coin December 31, 1901	$1,050,825,386	$622,288,222	$1,673,113,608
Net imports United States coin, calendar year 1902		[a]356,330	356,330
Coinage, calendar year 1902	47,109,853	30,028,167	77,138,020
Total	1,097,935,239	652,672,719	1,750,607,958
Loss:			
Net exports United States coin, calendar year 1902	7,250,927		7,250,927
United States coin melted for recoinage (face value)	1,147,612	3,361,789	4,509,401
United States coin taken out in transports for disbursement in the Philippine Islands, not recorded at the custom-house, calendar year 1902		51,800	51,800
United States coin estimated to have been used in the arts	1,500,000	100,000	1,600,000
Total	9,898,539	3,513,589	13,412,128
Estimated stock of coin in the United States December 31, 1902	1,088,036,700	649,159,130	1,737,195,830

[a] Of this amount $150,000 were in 1-dollar pieces.

NOTE.—The number of standard silver dollars coined to December 31, 1902, was 551,116,205, which, added to the Hawaiian coinage of 500,000, equals 551,616,205. Since July 1, 1898, the net amount of standard silver dollars exported has been 2,345,000 (deducting 150,000 pieces returned from the Philippine Islands June, 1902), and since 1883 the number melted has been 177,704 (Report of the Director of the Mint, 1902, p. 17), a total disposition of 2,552,704, leaving in the United States on December 31, 1902, 549,093,501 standard silver dollars and $100,065,629 in subsidiary silver coins.

In the Appendix will be found tables giving in detail the source from which these amounts were obtained.

On December 31, 1902, the cost value of the gold and silver bullion owned by the Government was as follows:

GOLD AND SILVER BULLION IN THE MINTS AND ASSAY OFFICES ON DECEMBER 31, 1902.

Metal.	Value.
Gold	$159,971,402
Silver (cost)	24,124,786
Total	184,096,188

The Mercantile Safe Deposit Company, in New York City, had on deposit in its vaults on the same date 9,316 ounces (fine) of silver bullion of the commercial value of $3,870, which, plus the stock of bullion in the mints and coin in the country, shows a total metallic stock as follows:

METALLIC STOCK IN THE UNITED STATES ON DECEMBER 31, 1902.

Bullion and coin.	Value.
Gold	$1,248,008,102
Silver (including amount held by Mercantile Safe Deposit Company)	673,287,786
Total	1,921,295,888

On December 31, 1901, the metallic stock was as follows:

METALLIC STOCK DECEMBER 31, 1901.

Bullion and coin.	Value.
Gold	$1,174,561,161
Silver (including amount held by Mercantile Safe Deposit Company)	664,959,921
Total	1,839,521,082

The increase in the total stock as compared with the previous year was $81,774,806, of which $73,446,941 was in gold and $8,327,865 in silver.

The location of the stock of metallic and paper money in the United States on December 31, 1902, was as follows:

LOCATION OF THE MONEYS OF THE UNITED STATES DECEMBER 31, 1902.

Moneys.	In Treasury.	Outside of Treasury.	Total.
Metallic:			
Gold bullion	$159,971,402		$159,971,402
Silver bullion	24,124,786	$3,870	
Gold coin	458,159,776	629,876,924	1,088,036,700
Silver dollars	470,943,462	78,150,039	549,093,501
Subsidiary silver coin	6,449,346	93,616,283	100,065,629
Total metallic	1,119,648,772	801,647,116	1,897,167,232
Paper:			
Legal-tender notes (old issue)	4,404,422	342,276,594	346,681,016
Legal-tender notes (act July 14, 1890)	168,271	23,884,729	24,053,000
National-bank notes	16,313,858	368,615,926	384,929,784
Total notes	20,886,551	734,777,249	755,663,800
Gold certificates	37,404,740	347,179,329	
Silver certificates	5,806,316	463,150,684	
Total certificates	43,211,056	810,330,013	
Grand total		2,346,754,378	2,652,831,032

GOLD AND SILVER USED IN INDUSTRIAL ARTS IN THE UNITED STATES DURING THE CALENDAR YEAR 1902.

The problem of industrial consumption of the precious metals has been the subject of special inquiry conducted by this Bureau for several years past, and is reserved for fuller treatment in my forthcoming report for the fiscal year ended June 30, 1903. A summary of the principal statements showing the quantity and value of precious metals used in industrial arts in the United States during the calendar year 1902 is submitted below.

Among the purveyors of gold and silver bars for use in the industrial arts the United States mint at Philadelphia and the United States assay office at New York hold the foremost places, which brings the larger portion of the total material consumed in the arts under Government notice as a matter of public record.

The following table gives the quantity and value of the bars issued by the Government institutions during the calendar year 1902:

GOLD AND SILVER BARS ISSUED FOR USE IN THE INDUSTRIAL ARTS BY THE GOVERNMENT INSTITUTIONS DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1902.

Material used.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
Domestic bullion (new material)	869,291.834	$17,969,857.06	1,607,462.46	$2,078,335.30
Old jewelry, etc	115,654.104	2,390,782.51	581,157.31	751,395.30
Foreign material	41,182.397	851,315.69	992,923.60	1,283,780.01
United States coin	216.571	4,476.91	200.35	259.03
Total	1,026,344.906	21,216,432.17	3,181,743.72	4,113,769.64

The United States coin given in the above table was either mutilated or abraded.

The percentage of the different materials used in the manufacture of bars by the Government institutions was as follows:

UNITED STATES BARS.

Material used.	Gold.	Silver.
	Per cent.	*Per cent.*
New material	84.7	50.5
Old material	11.3	18.3
Foreign material	4	31.2
United States coin	....	....
Total	100	100

The table following gives the quantity and value of the bars manufactured by private refineries and sold for use in the arts during the calendar year 1902:

BARS FOR INDUSTRIAL USE MANUFACTURED BY PRIVATE REFINERIES AND FURNISHED GOLDSMITHS AND OTHERS DURING THE CALENDAR YEAR 1902.

Material used.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
Domestic bullion, new material	33,077	$683,768	13,629,248	$17,621,654
United States coin	20,343	420,514	500	646
Foreign material	17	357	296,700	383,612
Old plate, jewelry, and other material	110,622	2,286,767	2,160,173	2,792,952
Total	164,059	3,391,406	16,086,621	20,798,864

The percentage of the different materials used by private refineries in the manufacture of bars was as follows:

PRIVATE REFINERY BARS.

Material used.	Gold.	Silver.
	Per cent.	*Per cent.*
Old material	67.4	13.4
New material	20.2	84.7
United States coin	12.4	....
Foreign material	....	1.9
Total	100	100

The total consumption of the precious metals in the arts during the year, reported to this Bureau by Government institutions and private refineries, was as follows:

Gold and Silver Bars Furnished Manufacturers for Use in the Arts during the Calendar Year 1902.

Material used.	Gold.	Silver (coining value.)	Total.
Domestic bullion, new material	$18,653,625	$19,699,990	$38,353,615
United States coin	424,991	905	425,896
Foreign material	851,673	1,667,392	2,519,065
Old material	4,677,549	3,544,347	8,221,896
Total	24,607,838	24,912,634	49,520,472

The percentage of the different materials used in the manufacture of bars for industrial purposes during the year 1902 was as follows:

Material used.	Gold.	Silver.
	Per cent.	*Per cent.*
New material	75.8	79.1
Old material	19.0	14.2
Foreign material	3.5	6.7
United States coin	1.7	....
Total	100	100

It will be seen from the above table that the percentage of new material to the total amount of gold used was 75.8 and silver 79.1.

Estimating, as in former years, that the amount of gold coin used in the arts yearly has been $1,500,000 and silver coin $100,000, the total industrial consumption during the year would be as follows:

Industrial Consumption of the Precious Metals During the Calendar Year 1902.

Material used.	Gold.	Silver (coining value).	Total.
Domestic bullion, new material	$18,653,625	$19,699,990	$38,353,615
United States coin	1,500,000	100,000	1,600,000
Foreign material	851,673	1,667,392	2,519,065
Old material	4,677,549	3,544,347	8,221,896
Total	25,682,847	25,011,729	50,694,576

The value of the gold bars furnished to the trade in exchange for gold coin monthly by the United States mint at Philadelphia and assay office at New York, under the provisions of the act of May 26, 1882, was as follows:

Gold Bars Exchanged for Gold Coin at the Mint at Philadelphia and Assay Office at New York during the Calendar Year 1902.

Months.	Philadelphia.	New York.	Total.
1902.			
January	$303,810.02	$1,406,492.86	$1,710,302.88
February	262,816.72	8,605,302.50	8,868,119.22
March	286,721.09	4,806,920.24	5,093,641.33
April	307,534.89	3,470,953.87	3,778,488.76
May	238,649.51	901,410.36	1,140,059.87
June	238,101.22	1,016,467.26	1,254,568.48
July	262,109.59	8,271,358.69	8,533,468.28
August	321,518.23	1,593,801.04	1,915,319.27
September	295,921.99	1,286,207.77	1,582,129.76
October	398,684.29	1,475,311.66	1,873,995.95
November	317,140.68	1,168,717.26	1,485,857.94
December	254,921.55	1,002,208.42	1,257,129.97
Total	3,487,929.78	35,005,151.93	38,493,081.71

These figures include both small bars manufactured for use in the arts and large bars manufactured for export.

The total amount was distributed as follows:

Exported	$22,559,854.71
Employed for industrial purposes	15,933,227.00
Total	38,493,081.71

The following table shows the amounts and the classification of gold and silver used in the industrial arts in the United States each year since 1880:

Gold and Silver Bars Furnished for Use in Manufactures and the Arts, and Classification of the Material Used, by Calendar Years, since 1880.

GOLD.

Calendar year.	United States coin.	New material.	Old material.	Foreign bullion and coin.	Total.
1880	$3,300,000	$6,000,000	$395,000	$1,267,600	$10,962,600
1881	2,700,000	7,000,000	522,900	1,547,800	11,770,700
1882	2,500,000	7,000,000	696,500	671,500	10,868,000
1883	4,875,000	7,840,000	1,549,300	194,500	14,458,800
1884	5,000,000	6,000,000	3,114,500	385,500	14,500,000
1885	3,500,000	6,736,927	1,408,902	178,913	11,824,742
1886	3,500,000	7,003,480	1,928,046	638,003	13,069,529
1887	3,500,000	9,090,342	1,835,882	384,122	14,810,346
1888	3,500,000	9,893,057	2,402,976	718,809	16,514,842
1889	3,500,000	9,686,827	3,218,971	291,258	16,697,056
1890	3,500,000	10,717,472	3,076,426	362,062	17,655,960
1891	3,500,000	10,697,679	4,860,712	628,525	19,686,916
1892	3,500,000	10,588,703	4,468,685	771,686	19,329,074
1893	1,500,000	8,354,482	2,777,165	804,254	13,435,901
1894	1,500,000	6,430,073	2,184,946	543,585	10,658,604
1895	1,500,000	8,481,789	2,976,269	471,027	13,429,085
1896	1,500,000	7,209,787	2,369,343	316,804	11,395,934
1897	1,500,000	7,184,822	2,571,428	613,981	11,870,231
1898	1,500,000	9,463,262	2,164,976	437,641	13,565,879
1899	1,500,000	13,267,287	2,734,985	344,906	17,847,178
1900	1,500,000	14,582,627	3,480,612	584,903	20,148,142
1901	1,500,000	16,296,688	3,386,626	685,642	21,868,956
1902	1,500,000	18,653,625	4,677,549	851,673	25,682,847
Total	61,375,000	218,178,929	58,802,699	13,694,694	352,051,322

SILVER (COINING VALUE).

1880	$600,000	$5,000,000	$145,000	$353,000	$6,098,000
1881	200,000	5,900,000	178,000	371,000	6,649,000
1882	200,000	6,344,300	212,900	440,300	7,197,500
1883	200,000	4,623,700	561,900	155,000	5,540,600
1884	200,000	4,500,000	170,000	650,000	5,520,000
1885	200,000	4,539,875	462,186	62,708	5,264,769
1886	200,000	3,626,195	404,155	825,615	5,055,965
1887	200,000	4,102,734	480,606	654,991	5,438,331
1888	200,000	6,477,857	652,047	771,985	8,101,889
1889	200,000	7,297,933	611,015	657,997	8,766,945
1890	200,000	7,143,635	640,100	1,245,419	9,229,154
1891	200,000	7,289,073	858,126	1,256,101	9,603,300
1892	200,000	7,204,210	647,377	1,249,801	9,301,388
1893	100,000	6,570,737	1,222,836	1,740,704	9,634,277
1894	100,000	8,579,472	1,221,177	982,399	10,883,048
1895	100,000	9,825,387	1,378,136	973,501	12,277,024
1896	100,000	7,965,449	1,076,829	1,061,995	10,204,273
1897	100,000	9,200,497	1,103,460	797,193	11,201,150
1898	100,000	10,176,784	949,312	632,449	11,858,545
1899	100,000	12,845,942	2,047,584	684,137	15,677,663
1900	100,000	13,476,829	2,296,250	1,215,935	17,089,014
1901	100,000	15,268,742	1,562,535	1,342,590	18,273,867
1902	100,000	19,699,990	3,544,347	1,667,392	25,011,729
Total	4,000,000	187,659,341	22,425,878	19,792,212	233,877,431

THE WORLD'S INDUSTRIAL CONSUMPTION.

Since 1893 this Bureau has endeavored to obtain, through the United States representatives abroad, official estimates from the various countries of the world of the consumption of precious metals in the arts and industries.

The interrogatories sent out by this Bureau for 1902 were as follows:

(4) What was the weight of fine gold used in the industrial arts during the calendar year 1902?

(5) What amount of this was new gold, what amount old gold, and what amount coins?

(6) What was the weight of fine silver used in the industrial arts during the calendar year 1902?

(7) What amount of this was new silver, what amount old silver, and what amount coins?

The reply "no data" was received from the following countries: Argentina, Brazil, Cape Colony, Denmark, Dutch Guiana, Ecuador, Egypt, Germany, Great Britain, Greece, India, Italy, Japan, Mexico, Persia, Peru, Queensland, Russia, Servia, Siam, Spain, Straits Settlements, Tasmania, and Victoria. Haiti reported "no industrial consumption of the precious metals."

In the case of the countries enumerated below, sufficient information was elicited by the interrogatories for making the estimates given.

From Austria.—Articles of gold (jewelry and wire) brought to the assay office to be stamped during the year 1902 show the domestic consumption of gold to have been as follows:

Description.	Gross weight.	Of the average fineness of 1902.	In fine gold.
	Kilograms.	*Thousandths.*	*Kilograms.*
Domestic articles of gold	5,149.626	581.751	2,995.800
Plated wares (that is the gold placed on the same 2.5 per cent of 126.400 kilograms)			3.160
Wire (that is the gold placed on the same 1.7 per cent of 1,911.507 kilograms)			32.495
Total			3,031.455

No data are on hand to show the amount of gold consumed during the year 1902 for other industrial uses, such as gilding by fire and galvanism.

In the year 1901 there were consumed 343.376 kilograms. According to the average of the last three years, the amount consumed in 1902 may be estimated at 477.572 kilograms.

Assuming that 27 per cent of the articles manufactured in 1902 of gold were made of old material, the amounts used in that year would be as follows: 2,212.963 kilograms fine, new gold, and 818.492 kilograms fine, old gold. Estimated consumption of new material, 2,700 kilograms fine.

The articles brought to the Imperial assay office in Vienna during the year 1902 to be stamped show the domestic consumption of silver to have been as follows:

Description.	Gross Weight.	Of the average fineness of 1902.	Fine Silver.
	Kilograms.	*Thousandths.*	*Kilograms.*
Domestic articles of silver	57,535.815	794.463	45,710.076
Wire			2,746.235
Total			48,456.311

There are no data showing the quantity of silver consumed during the year 1902 for other industrial purposes. During the year 1901, 8,453.797 kilograms were consumed. According to the average of the last three years it is estimated that 10,400 kilograms were consumed.

Assuming that 15 per cent of the articles of silver stamped during the year 1902 were manufactured of old material, the amounts used in that year would be as follows: 41,187.864 kilograms fine, new silver, and 7,268.447 kilograms fine, old silver. Estimated consumption of new material, 51,600.

From Hungary.—No data are at hand showing the quantity of gold and silver used for industrial purposes. There were presented in 1902 at the Royal Hungarian Assay Offices for the purpose of being officially stamped:

A.—*Domestic goods.*

	Kilograms.
(1) Gold ware	1,416.19
(2) Silver ware	9,040.30
(3) Gilt wire	102.82
(4) Silver wire	275.14

B.—*Foreign goods.*

(5) Miscellaneous gold ware	229.98
(6) Miscellaneous silver ware	1,936.57
(7) Gold watches	153.33
(8) Silver watches	1,251.52

For the striking of commemorative medals, were used 1.165 kilograms of fine gold and 6.24 kilograms of fine silver. Estimated consumption of new gold, 1,500 kilograms; silver, 7,200 fine.

From France.—Fine gold used in the industrial arts during calendar year 1902, about 24,600 kilograms. Fine silver used in the industrial arts during calendar year 1902, about 257,000 kilograms.

No information as to what amount of this was new or old gold and silver.

NOTE.—The amount of silver and gold ware stamped at the mint during the year 1902 was, gold, 11,420 kilograms; silver, 134,000 kilograms. Estimated consumption new material, gold, 17,000 kilograms; silver, 206,000 kilograms.

From Great Britain.—No information available. The bureau of the mint has received no information as to the industrial gold consumption of England in 1902, and recourse is therefore had, as last year, to an estimate of the same. According to the memorandum by Mr. T. Kirke Rose, chemist and assayer, published in the report of the deputy master of the royal mint, London, the number of ounces of gold wares assayed and marked by the wardens of the assay offices at Birmingham and Chester, in the fiscal year 1901-2, was 525,833.

These figures are far from representing the total industrial gold consumption of the United Kingdom, which must, if we are to be guided by earlier estimates, be placed at at least twice these amounts.

Professor Lexis estimated it to have been, in 1895, 500,000 ounces, or about 15,500 kilograms, net, or, in other words, that the wares stamped represented, approximately, 60 per cent of the actual consumption of fine gold in the industrial arts. After making an allowance for the old material, this bureau estimates the industrial consumption of gold in Great Britain during 1902 at 25,000 kilograms fine.

The amount of silver stamped in 1901-2 was 5,934,460 ounces fine.

Professor Lexis estimated the net silver consumption of England, in 1895, at 140,000 kilograms, or, in other words, that the wares stamped represented, approximately, 60 per cent of the actual consumption of fine silver in the arts. This bureau estimates the amount used in this manner in 1901 at 285,000 kilograms.

From The Netherlands.—Amount of fine gold used in industrial arts during 1902 may be estimated at 652 kilograms, fine. Estimated consumption of new material, 475 fine kilograms; silver, 12,415. Amount of silver, or amount of new and old gold and silver used in the arts, can not be given.

From Portugal.—The gold used in the industrial arts in the year 1902 amounted to 2,755 kilograms. Estimated consumption of new material, 2,000 fine kilograms. The silver used by silversmiths in the year 1902 weighed 14,626 kilograms. Estimated consumption of new material, 11,700 kilograms.

From Sweden.—At least 600 kilograms of fine gold is annually used in Sweden in the industrial arts, but the exact quantity can not be stated. It is impossible to state how much of this is new and old gold; or gold coin. Estimated consumption of new material, 440 kilograms.

At least 6,000 kilograms of fine silver is annually used in the industrial arts, but the exact quantity can not be stated. It is impossible to state how much of this is new or old silver. Estimated consumption of new material, 4,800 kilograms.

From Switzerland.—The total weight of fine gold used in the industrial arts in Switzerland during the year 1902 is about 8,700 kilograms; equivalent to 30,000,000 francs. Of this quantity about 5,220 kilograms (18,000,000 francs) were new gold, and about 3,480 kilograms (12,000,000 francs) were old gold. The gold pieces melted down for industrial use are included in the new gold; the exact proportions of these, however, can not be specified. The new material is estimated at 5,220 kilograms.

The total weight of fine silver used for the industries during the year 1902 is about 68,200 kilograms (6,000,000 francs), according to the present value of fine silver. Of this quantity about 53,200 kilograms (4,680,000 francs) were new silver, and about 15,000 kilograms (1,320,000 francs) were old silver. As to what concerns the question of melting silver coins, it is evident that those coins are not used in the industrial arts, for the reason that the result of such operation would be a loss of actually 60.4 per cent. These replies are based on approximative information. The new material is estimated at 53,200 kilograms.

United States.—Gold 29,988 kilograms, fine; silver 514,155 kilograms, fine. The total consumption definitely reported is gold 84,323 kilograms, fine; silver 1,146,070 kilograms, fine.

The figures in the case of the United States are known to be very near the truth, and while it is admitted that the returns from the other countries are far from accurate, it is believed that they are sufficiently so to warrant making an estimate of the world's industrial consumption of the precious metals.

This Bureau estimates the industrial consumption of the precious metals by those countries which made no report for 1902 as follows: Gold, 29,677 fine kilograms; silver, 363,000 fine kilograms. The total consumption of the world is accordingly estimated to have been: Gold, 114,000 fine kilograms, of the value of $75,764,400, and silver, 1,509,070 kilograms, worth, at $17 per kilogram (commercial value), the average price during 1902, $25,654,190.

WORLD'S PRODUCTION OF GOLD AND SILVER IN 1902.

GOLD.

During the calendar year 1902 the world produced 14,313,660 fine ounces of gold, of the value of $295,889,600, thus exceeding the output of1901 by 1,572,914 ounces, or $32,514,900, a gain of over 12 per cent. Of this increase, 1,448,069 fine ounces were African gold, the Transvaal having made great progress since the cessation of hostilities, although what may be regarded as its normal product has not yet been reached. The total increase in the remaining countries of the world was only 124,845 ounces.

The United States produced 3,870,000 ounces of gold during the year under examination, but dropped from first to second place, as Australia yielded 3,946,374 ounces. Africa was third, her output amounting to 1,887,773 fine ounces; Russia followed with 1,090,053 ounces. The remaining large producers, ranged according to the value of their yields, were Canada, 1,003,355 ounces; Mexico, 491,156 ounces; British India, 463,824 ounces, and China, 422,401 ounces. Thus these eight countries together produced 13,174,936 ounces, or over 92 per cent of the world's output for 1902.

Separated according to political divisions, the British Empire leads, it having yielded approximately 7,400,000 ounces, or nearly one-half of the world's output. The United States holds second place, having produced over 25 per cent of the total.

The following table shows the amount of gold produced by each of the great continents:

	Fine ounces.
North America (including Central America)	5, 461, 353
Australia	3, 946, 374
Africa	1, 887, 773
Europe	1, 209, 216
Asia	1, 194, 795
South America	614, 149
Total	14, 313, 660

SILVER.

In 1902 the world produced 166,955,639 fine ounces of silver, of the commercial value (at 53 cents per ounce) of $88,486,500. The yield was 8,042,934 fine ounces less than that of 1901, and its commercial value was further decreased by the fall in price from 60 to 53 cents, it having been $88,486.500 against a valuation of $104,999,100 in 1901—a diminution of $16,512,600.

Mexico held its place as the greatest silver producer, her output amounting to 60,176,604 fine ounces; the United States followed with 55,500,000. The remaining large producers were: Bolivia, 12,992,641 fine ounces; Australia, 8,026,037; Germany, 5,722,641; Canada, 4,303,774, and Peru, 4,264,528 fine ounces. These seven countries, therefore, together produced 150,986,225 fine ounces, which is over 90 per cent of the total yield of the world.

The geographical origin of the product, by continents, was as follows:

	Fine ounces.
North America	119, 980, 378
South America	23, 619, 983
Europe	14, 820, 372
Australia	8, 026, 037
Asia	508, 869
Total	166, 955, 639

(Africa produced no silver.)

The total value of the world's production of the precious metals in 1902 was $384,376,100, distributed as follows:

North America	$177, 000, 600
Australia	85, 832, 600
Africa	39, 023, 700
Europe	32, 851, 500
Asia	24, 968, 300
South America	24, 699, 400
Total	384, 376, 100

The output, therefore, exceeded that of 1901 in value by $16,002,300.

Increase and Decrease during 1902 as Compared with 1901.

Country.	Gold.		Silver.	
	Increase in 1902.	Decrease in 1902.	Increase in 1902.	Decrease in 1902.
	Fine ounces.	*Fine ounces.*	*Fine ounces.*	*Fine ounces.*
United States	64,500		286,000	
Mexico		6,371	2,520,055	
Canada		163,861		938,923
Africa	1,448,069			
Australasia	227,294			2,204,009
Russia		15,359	1,686	
Austria-Hungary	1,674			115,574
Germany	130		200,993	
Norway	97		40,511	
Sweden	1,006			7,760
Italy			6	
Spain	76		514,873	
Portugal				17
Greece				63,858
Turkey	295		51,386	
Finland			836	
France			76	
Great Britain				89
Argentina				7,446
Bolivia		5,558		54
Chile		23,801		5,688,338
Colombia		13,482		105,045
Ecuador	4,354		2	
Brazil		37,772		
Venezuela	5,447		1,887	
Guiana:				
British	1,790			
Dutch		4,044		
French	20,327			
Peru	84,700		697,660	
Uruguay	1,266			45
Central America	65,868		91,654	
Japan	4,132			1,339,036
China		17,400		
Korea		48,374		
British India	9,297			
East Indies:				
British	8,001			
Dutch	3,270		6,925	
Total	1,951,593	336,022	4,414,550	10,470,194
Net increase or decrease	1,615,571			6,055,644

The following table shows, by calendar years, the production and value of gold and silver in the world since 1860:

Product of Gold and Silver in the World Since 1860.

[The annual production of 1860 to 1872 is obtained from 5-year period estimates, compiled by Dr. Adolph Soetbeer. Since 1872 the estimates are those of the Bureau of the Mint.]

Calendar year.	Gold.		Silver.		
	Fine ounces.	Value.	Fine ounces.	Commercial value.	Coining value.
1860	6,486,262	$134,083,000	29,095,428	$39,337,000	$37,618,000
1861	5,949,582	122,989,000	35,401,972	46,191,000	45,772,000
1862	5,949,582	122,989,000	35,401,972	47,651,000	45,772,000
1863	5,949,582	122,989,000	35,401,972	47,616,000	45,772,000
1864	5,949,582	122,989,000	35,401,972	47,616,000	45,772,000
1865	5,949,582	122,989,000	35,401,972	47,368,000	45,772,000
1866	6,270,086	129,614,000	43,051,583	57,646,000	55,663,000
1867	6,270,086	129,614,000	43,051,583	57,173,000	55,663,000
1868	6,270,086	129,614,000	43,051,583	57,086,000	55,663,000
1869	6,270,086	129,614,000	43,051,583	57,043,000	55,663,000
1870	6,270,086	129,614,000	43,051,583	57,173,000	55,663,000
1871	5,591,014	115,577,000	63,317,014	83,958,000	81,864,000
1872	5,591,014	115,577,000	63,317,014	83,705,000	81,864,000
Total	78,766,630	1,628,252,000	547,997,231	729,563,000	708,521,000
1873	4,653,675	96,200,000	63,267,187	82,120,800	81,800,000
1874	4,390,031	90,750,000	55,300,781	70,674,400	71,500,000
1875	4,716,563	97,500,000	62,261,719	77,578,100	80,500,000
1876	5,016,488	103,700,000	67,753,125	78,322,600	87,600,000
1877	5,512,196	113,947,200	62,679,916	75,278,600	81,040,700
1878	5,761,114	119,092,800	73,385,451	84,540,000	94,882,200
1879	5,262,174	108,778,800	74,383,495	83,532,700	96,172,600
1880	5,148,880	106,436,800	74,795,273	85,640,600	96,705,000
1881	4,983,742	103,023,100	79,020,872	89,925,700	102,168,400
1882	4,934,086	101,996,600	86,472,091	98,232,300	111,802,300
1883	4,614,588	95,392,000	89,175,023	98,984,300	115,297,000
1884	4,921,169	101,729,600	81,567,801	90,785,000	105,461,400
1885	5,245,572	108,435,600	91,609,959	97,518,800	118,445,200
1886	5,135,679	106,163,900	93,297,290	92,793,500	120,626,800
1887	5,116,861	105,774,900	96,123,586	94,031,000	124,281,000
1888	5,330,775	110,196,900	108,827,606	102,185,900	140,706,400
1889	5,973,790	123,489,200	120,213,611	112,414,100	155,427,700
1890	5,749,306	118,848,700	126,095,062	131,937,000	163,032,000
1891	6,320,194	130,650,000	137,170,919	135,500,200	177,352,300
1892	7,094,266	146,651,500	153,151,762	133,404,400	198,014,400
1893	7,618,811	157,494,800	165,472,621	129,119,900	213,944,400
1894	8,764,362	181,175,600	164,610,394	104,493,000	212,829,600
1895	9,615,190	198,763,600	167,500,960	109,545,600	216,566,900
1896	9,783,914	202,251,600	157,061,370	105,859,300	203,069,200
1897	11,420,068	236,073,700	160,421,082	96,252,700	207,413,000
1898	13,877,806	286,879,700	169,055,253	99,742,600	218,576,800
1899	14,837,775	306,724,100	168,337,453	101,002,600	217,648,200
1900	12,315,135	254,576,300	173,591,364	107,626,400	224,441,200
1901	12,698,089	262,492,900	173,011,283	103,805,700	223,691,300
1902	14,313,660	295,889,600	166,955,639	88,486,500	215,861,800
Total	221,125,959	4,571,079,500	3,462,569,948	2,961,334,300	4,476,857,800
Grand total	299,892,589	6,199,331,500	4,010,567,179	3,190,897,300	5,185,378,800

WORLD'S COINAGE, 1900, 1901, AND 1902.

In the Appendix will be found a table, revised from the latest information received, exhibiting the coinages of the various countries of the world during the calendar years 1900, 1901, and 1902.

COINAGE OF NATIONS.

Calendar year.	Gold.	Silver.
1900	$354,936,497	$185,358,156
1901	248,093,787	138,911,891
1902	220,405,125	193,715,362

While the above figures represent, as accurately as the Bureau has been able to ascertain, the total value of the gold and silver coinage of the world during the calendar years 1900, 1901, and 1902, they do not accurately represent the value of the coinage from new material alone, but include the value of the recoinage of foreign and domestic coins and that derived from old material, plate, jewelry, etc., melted and used in coinage. Many foreign governments in their reports to the Bureau failed to separate the values of the coinage derived from these various sources.

The following table exhibits, by calendar years, the fine ounces and value of the gold and silver coinage of the world since 1873:

COINAGE OF GOLD AND SILVER BY THE MINTS OF THE WORLD FOR THE CALENDAR YEARS SINCE 1873.

Calendar year.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Coining value.
1873	12,462,890	$257,630,802	101,741,421	$131,544,464
1874	6,568,279	135,778,387	79,610,875	102,931,232
1875	9,480,892	195,987,428	92,747,118	119,915,467
1876	10,309,645	213,119,278	97,899,525	126,577,164
1877	9,753,196	201,616,466	88,449,796	114,359,332
1878	9,113,202	188,386,611	124,671,870	161,191,913
1879	4,390,167	90,752,811	81,124,555	104,888,313
1880	7,242,951	149,725,081	65,442,074	84,611,974
1881	7,111,864	147,015,275	83,539,051	108,010,086
1882	4,822,851	99,697,170	85,685,996	110,785,934
1883	5,071,882	104,845,114	84,541,904	109,306,705
1884	4,810,061	99,432,795	74,120,127	95,832,084
1885	4,632,273	95,757,582	98,044,475	126,764,574
1886	4,578,310	94,642,070	96,566,844	124,854,101
1887	6,046,510	124,992,465	126,388,502	163,411,397
1888	6,522,346	134,828,855	104,354,000	134,922,344
1889	8,170,611	168,901,519	107,788,256	139,362,595
1890	7,219,725	149,244,965	117,789,228	152,293,144
1891	5,782,463	119,534,122	106,962,049	138,294,367
1892	8,343,387	172,473,124	120,282,947	155,517.347
1893	11,243,342	232,420,517	106,697,783	137,952,690
1894	11,025,680	227,921,032	87,472,523	113,095,788
1895	11,178,855	231,087,438	98,128,832	126,873,642
1896	9,476,639	195,899,517	123,394,239	159,540,027
1897	21,174,850	437,722,992	129,775,082	167,790,006
1898	19,131,244	395,477,905	115,461,020	149,282,936
1899	22,548,101	466,110,614	128,566,167	166,226,964
1900	17,170,053	354,936,497	143,362,948	185,358,156
1901	12,001,537	248,093,787	107,439,666	138,911,891
1902	10,662,098	220,405,125	149,826,725	193,715,362
Total	288,045,904	5,954,437,344	3,127,875,598	4,044,121,999

PART II.

REPORTS OF THE SPECIAL AGENTS OF THE BUREAU OF THE MINT ON THE PRODUCTION OF THE PRECIOUS METALS IN 1902 IN THE SEVERAL STATES AND TERRITORIES.

ALASKA.

By Charles G. Yale.

The following table shows the gold and silver product of Alaska for the calendar year 1902:

Bullion of Alaskan Production Received at the United States Mints and Assay Offices and Private Refineries and Smelters during the Calendar Year 1902.

Metal.	Standard ounces.	Value.
Gold	445, 235. 377	$8, 283, 408. 75
Silver (coining value)	99, 322. 66	115, 571. 84
Total value		8, 398, 980. 59

This shows an increase of combined gold and silver of $1,400,254.60 over the year 1901, at which time the total yield was $6,998,725.99.

The gold alone in 1902 was $8,283,408.73, and in 1901 it was $6,932,226.86, so an increase is shown of $1,351,181.87. The silver (coining value) in 1902 was $115,571.84 and in the previous year was $66,499.13, so there is an increase of $49,072.71 for the year in the silver. The commercial value of the silver at 52.16 cents per standard ounce was $46,626.02.

Derived from the Nome region was $4,542,188 gold and $19,681 (coining value) silver, a total of $4,561,869; from all the rest of Alaska (including Nome) was $3,741,220 gold and $95,890 silver, a total of $3,837,110.

Comparing the total output of the Nome region for 1902 with that of 1901 ($4,131,687) it is seen that the increase for the year is $430,182. For the balance of Alaska the increase amounts to $970,072, showing that there is a larger increase apparent for the quartz mines and the other placer fields of Alaska than from the Nome regions alone.

Returns received from the quartz mines on Douglas and Unga islands show a total quartz output of $2,577,883, including $11,346 in silver.

This makes a total yield of the Nome placers and the quartz mines of southeastern Alaska of $7,139,752, thus leaving $1,259,228 as the yield of all the rest of Alaska for the year under review. The increase, therefore, from Alaskan placers aside from those of Nome, and including the quartz yield, is $373,964. The following shows increased yield in the different fields:

Increase in Nome fields	$430, 182
Increase in quartz product	596, 108
Increase in balance of Alaska	373, 964
Total increase	1, 400, 344

It is to be noted that the increase of yield is most marked in the quartz mines. These mines obtained from a total of 1,350,132 tons mined and milled the sum of $2,577,883 gold and silver, the proportion of silver being small. Thus it is seen that the grade of the ore is low, but the large milling capacity and the conditions under which mining is carried on makes it possible to realize a good profit in remarkably low-grade ore. In fact quartz mining is generally conducted in Alaska at a lower cost per ton of mining and milling than elsewhere in the United States. The bodies of ore are exceptionally large and of uniform grade. Supplies, machinery, etc., are transported by sea direct to the mines and no railroad charges have to be incurred. Thus they may be delivered from San Francisco cheaper in Alaska than in mining camps within 100 or 200 miles of that city.

It is not, as many suppose, cheap wages which permit the cheap mining and milling. The largest quartz mine in Douglas Island works 800 men and the average wages are $3.25 per day, including board and lodging; another one employs 180 men at the same rate; still another with 250 men pays an average rate of $3.20 per day, including board and lodging. Another quartz mine on Unga Island pays 40 men $3 a day in the mine and 7 men $3.50 per day in the mill. These wages are as good as the average paid in precious-metal mines in other parts of the United States. The quartz mining interests of Alaska are rapidly increasing in importance. A number of new properties are being opened and in due time will be suitably equipped. It is only men of capital or large corporations which can make a success of quartz mining in that region, the wide ledges and low grade of the ore, generally speaking, requiring heavy investments for reduction plants of suitable capacity to put through daily sufficient ore to make the venture profitable.

It has been practically impossible, under past and present conditions of mining in Alaska, to obtain statistics of output of individual properties, except in the case of the quartz mines. Those portions where the placers are worked at Nome, Golovin, and the Yukon and other river camps are inaccessible in winter, and most of the miners leave for the "outside" about the middle or end of October. Those who stay do little or no mining during that season. Most of the active placer work is done during the summer. While there are some companies engaged in mining on a large scale, there are some thousands of men working claims for themselves and often going from one camp to another. The claims are mainly numbered and not named, and the owners change frequently. For these reasons it has been found impossible to keep from year to year any correct list of mines or owners to which letters of inquiry as to output might be addressed.

The custom is, therefore, to depend on the receipts at United States mints and assay offices and private refineries and smelters to arrive at any approximation of the total yield for each year. When these deposits are made, those from Nome are segregated, but not so with the rest of Alaska. Of course the yield of the quartz properties is readily ascertained, and the Nome yield being known by the plan described, the yield of the balance of Alaska may be approximated.

Still, no attempt has been thus far made to segregate the amounts coming from the Koyukuk section, Rampart, Tanana, Fortymile, or other river camps farther in the interior than Nome. The gold all comes out and is accounted for, but exactly how much each of the separate camps may produce is not ascertainable.

In the amount credited to Nome is also the gold from the Golofnin

Bay and Fish River region, and in fact all the gold from the lower portion of the Seward Peninsula which comes out by way of Nome or is purchased or deposited for shipment at that point. Nome, therefore, covers a much larger section, as far as gold product is concerned, than the mere streams and beaches at that particular place.

In fact, very extensive operations are being carried on at Ophir Creek, in the Golofnin Bay region, about 60 miles back of Nome, and the yield from that creek is now about as much as from any other in Alaska, if not more. The creek is a very long one and some of the claims, notably those at about Nos. 15, 16, 17, 18, 19, etc., are very productive. Water has been brought in, ditches built, and a good supply of water is provided for many of the mines. The bench claims in this same creek have also paid well at certain points. In fact, doubtless a goodly proportion of the increased product credited to Nome in the figures given in this chapter came from this Ophir Creek.

The season at Nome itself was not a very favorable one for water supply, yet it was better than the previous one. The settlement of titles to claims, before in bad confusion, was beneficial to the camps and, indeed, the whole region. The pumping plants supplying water to Anvil and some other creeks served a good purpose. Anvil, Glacier, Dexter, and Dry creeks, Nicols, Snow, and other gulches, and many other less known creeks, all supplied their quota of the gold output. Farther west and north along the coast, as well as back into the interior, prospectors have pushed their way and are working and developing claims. The area of productive ground in and surrounding the district is much larger than was at first expected. It was at first thought the productive portion was confined to the sea beaches and a few near-by creeks. However, the prospectors very soon showed that gold was to be found at many places within a hundred miles of Nome. Moreover, the beaches, supposed to have been worked out in the first two years, are still paying reasonably well with suitable plants for handling the ruby sand.

Although the gravel is shallow to bedrock, and in many places very rich, it has come to be realized that companies and capitalists can do much better than individuals in mining, so it is not so much of a "poor man's country" as at first supposed. The reason of this is that to get any desirable length of water season, water must be stored or pumped, and ditches and reservoirs built. It is mainly on account of this that so many individual claims have been sold to become the property of companies financially able to bring in a suitable water supply. This water supply of the creek claims gives practical control of the bench claims as well. In fact, the men controlling the water supply practically control the mining situation.

A few railroads have been built, more are in course of construction, and still others are planned for the Nome and Council City (Golovin) sections, and this naturally lessens transportation and cost of machinery and supplies. It is evident that those who have made the largest investments have faith in the permanence of the diggings and are prepared to put still more money into those mining districts on the Seward Peninsula.

At Circle City, Fortymile, Rampart, and other Yukon River camps work steadily progresses on many claims, without any of the excitement or "booming" experienced in the earlier days succeeding the "Klondike rush." The camps along the upper part of the river now get their supplies more surely and cheaply by means of the upper Yukon steamers, etc., via Dawson. The lower river steamers, however, still continue to carry the heavy freight, via St. Michael, but low water in the fall has prevented as many trips as were desirable.

The Tanana diggings, about which there was considerable excitement, have not proved very extensive, though some rich creeks are being worked. No very great results have been achieved along the Koyukuk or its branches, although gold is found on almost all of them. Much of the ground in that section will only pay to hydraulic—a doubtful process in a country with such a short water season and so much ice and cold, when the necessary investment is considered.

Extensive finds of copper have been made in the Valdez and Copper River regions and many claims have been located and are being developed, but have not yet become productive. Mineral ore has been found in the Copper River and other districts in southern Alaska at several places and wells are being sunk. Thus far little or no production has been made, however.

In connection with this northern region the following table is given, showing the yield from the Klondike gold field in Northwest Territory for 1902:

BULLION OF NORTHWEST TERRITORY PRODUCTION RECEIVED AT UNITED STATES MINTS AND ASSAY OFFICES AND PRIVATE REFINERIES AND SMELTERS DURING THE CALENDAR YEAR 1902.

Metal.	Standard ounces.	Value.
Gold	777,946.617	$14,473,355.29
Silver (coining value)	185,237.88	215,542.79
Total value		14,688,898.08

BULLION OF ALASKA PRODUCTION RECEIVED AT UNITED STATES MINTS AND ASSAY OFFICES AND PRIVATE REFINERIES AND SMELTERS DURING THE CALENDAR YEAR 1902.

Institution and company.	Standard ounces.	
	Gold.	Silver.
Mint at San Francisco	9,092.336	1,072.43
Mint at Philadelphia	1,204.646	111.63
Mint at New Orleans	13.226	1.22
Assay office at St. Louis	49.983	6.69
Assay office at New York	369.751	49.88
Assay office at Seattle	208,391.547	18,303.76
Assay office at Denver	231.788	36.49
Selby Smelting Co., San Francisco	158,233.000	8,888.00
American Smelting and Refining Co	172.000	5,032.00
Tacoma Smelting Co	67,477.100	65,820.56
Total	445,235.377	99,322.66
From Nome	244,143.792	16,914.28
From balance of Alaska	201,091.585	82,408.38
Total	445,235.377	99,322.66

	Gold.	Silver.	
	Value.	Coining value.	Commercial value.
From Nome	$4,542,188.07	$19,681.45	$7,940.23
From balance of Alaska	3,741,220.66	95,890.39	38,685.79
Total	8,283,408.73	115,571.84	46,626.02

BULLION OF NORTHWEST TERRITORY PRODUCTION RECEIVED AT UNITED STATES MINTS AND ASSAY OFFICES AND PRIVATE REFINERIES AND SMELTERS DURING THE CALENDAR YEAR 1902.

Institution and company.	Standard ounces.	
	Gold.	Silver.
Mint at San Francisco	32,847.818	7,708.91
Mint at Philadelphia	335.170	85.92
Mint at New Orleans	29.013	2.33
Assay office at Charlotte	1.118	.35
Assay office at New York	570.791	159.52
Assay office at Seattle	348,940.707	81,503.85
Selby Smelting Co., San Francisco	395,222.000	95,777.00
Total	777,946.617	185,237.88
Coining values	$14,473,355.29	$215,542.79
Commercial value (silver)		86,958.07

ALASKA PRODUCTION RECEIVED AT UNITED STATES MINTS AND ASSAY OFFICES AND ALSO AT PRIVATE REFINERIES AND SMELTERS DURING THE YEAR 1902.

GOLD.

Institution and company.	Standard ounces.	Value.
Mint at San Francisco	9,092.336	
Mint at Philadelphia	1,204.646	
Mint at New Orleans	13.226	
Assay office at St. Louis	49.983	
Assay office at New York	369.751	
Assay office at Seattle	208,391.547	
Assay office at Denver	231.788	
Selby Smelting Co., San Francisco	158,233.000	
American Smelting and Refining Co	172.000	
Tacoma Smelting Co	67,477.100	
Total	445,235.377	$8,283,408.73
From Nome	244,143.792	4,542,188.07
From balance of Alaska	201,091.585	3,741,220.66
Total	445,235.377	8,283,408.73

SILVER.

Institution and company.	Standard ounces.	Coinage value.	Commercial value.
Mint at San Francisco	1,072.43		
Mint at Philadelphia	111.63		
Mint at New Orleans	1.22		
Assay office at St. Louis	6.69		
Assay office at New York	49.88		
Assay office at Seattle	18,303.76		
Assay office at Denver	36.49		
Selby Smelting Co., San Francisco	8,888.00		
American Smelting and Refining Co	5,032.00		
Tacoma Smelting Co	65,820.56		
Total	99,322.66	$115,571.84	$46,626.02
From Nome	16,914.28	19,681.45	7,940.23
From balance of Alaska	82,408.38	95,890.39	38,685.79
Total	99,322.66	115,571.84	46,626.02

KLONDIKE PRODUCTION RECEIVED AT UNITED STATES MINTS AND ASSAY OFFICES AND ALSO AT PRIVATE REFINERIES AND SMELTERS DURING THE YEAR 1902.

GOLD.

Institution and company.	Standard ounces.	Value.
Mint at San Francisco	32,847.818	
Mint at Philadelphia	335.170	
Mint at New Orleans	29.013	
Assay office at Charlotte, N. C	1.118	
Assay office at New York	570.791	
Assay office at Seattle	348,940.707	
Selby Smelting Co., San Francisco	395,222.000	
Total	777,946.617	$14,473,355.29

SILVER.

Institution and company.	Standard ounces.	Coining value.	Commercial value.
Mint at San Francisco	7,708.91		
Mint at Philadelphia	85.92		
Mint at New Orleans	2.33		
Assay office at Charlotte, N. C	.35		
Assay office at New York	159.52		
Assay office at Seattle	81,503.85		
Selby Smelting Co., San Francisco	95,777.00		
Total	185,237.88	$215,542.79	$86,958.07

ARIZONA.

By Charles C. Randolph,

Phoenix, Ariz.

In my report on the gold and silver product of Arizona in 1901 I ascribed the slight falling off in production to two agencies—fire and litigation. In examining the figures and statements submitted to me in connection with mining operations in the Territory in 1902, I find that the unprecedented drought, which continued most of the year, caused a further diminution in the output of the precious metals. The figures for the year follow:

Gold	$4,160,000
Silver (commercial value)	1,680,000

At the risk of being considered a chronic apologist for Arizona, I must insist that these figures do an injustice to the Territory. If the climatic conditions which prevailed in November and December, 1902, had obtained in the closing months of the preceding year, the output, judging from preparations that were making for extensive operations throughout the mineral belt, would have far exceeded that of 1900, which was greatly in excess of that of any previous year. But 1901 was very dry, and there was no relief until last November, when heavy rains set in and continued at intervals for weeks. In the mountains there were heavy falls of snow, with the result that the water courses were filled, and have continued until this time of writing to carry a heavy volume of water.

The stimulus afforded to mining by the advent of water in unlimited quantities came too late to improve the statistics covering the year's operations, but I am assured by miners throughout the Territory that the year 1903 is likely to prove a record breaker.

In spite of the drought, which affected all kinds of mining, there was a tremendous amount of development work done, and prospectors were not deterred from prosecuting their search for mineral. New railroads were projected, and trains are now running in regions that were practically inaccessible except by mountain trails at the time my last report was written. The extension of the Prescott and Eastern road into the heart of the Bradshaws has worked results that have surprised even the projectors of the railway.

These mountains have long been known to be rich in mineral and many mines have been operated there, but naturally at a great disadvantage because of the lack of transportation facilities. Only mines the most favorably situated and carrying the highest values were able to maintain a fairly regular record of operation. By the time this report is in print the Bradshaws road will be in full operation and there will have been an awakening of mining in Yavapai County such as has not been witnessed in the Rocky Mountain region since the Denver and Rio Grande brought the interior of Colorado into touch with the outside world.

The new mining era in northern Arizona practically began with the completion of the Prescott and Eastern to the Poland mine. The Poland property alone warranted the construction of the railway, as will be seen by the statement concerning that mine, which appears further on in this report. The Poland-Lynx Creek tunnel, which is to be operated in connection with the railway, is the most ambitious undertaking of the kind that is to be found in all the western country. It is well known to mining men in Arizona that there are more gold ledges of proved value in the Lynx Creek district than within a similar radius elsewhere in the Territory, or perhaps in the entire West. There has not been a doubt as to the future of the district. Its chief handicap has been lack of shipping facilities. Notwithstanding its close proximity to Prescott, the surrounding mountains presenting as they have great obstacles to the construction of a railway have held the district securely hemmed in from the outside world. To construct a railway in the Lynx Creek district has never seemed practicable.

The problem was solved at last by the tunnel project. This tunnel, over one mile and a half in length, pierces the mountain at a maximun depth of a thousand feet from the summit. Starting from the Poland mill it emerges on the Lynx Creek side at the famous Mud Hole mine and is being so constructed as to give a down grade all the way to the railway terminus at the Poland. When finished it will be equipped with a double-track railway, the motive power of which will probably be either electricity or compressed air.

While the tunnel is primarily to develop the many veins which traverse the properties of the Poland Mining Company, popular interest in it naturally attaches to its future as a public enterprise. As a highway for the transportation of supplies to the Lynx Creek country and for the conveyance of ores, concentrates, and bullion therefrom it will be one of the most valued trade arteries in all Arizona and will have a direct influence in upbuilding the Territory's mining prestige.

The present wagon haul of 14 miles over heavy grades constitutes a difficult obstacle to the growth of the district; as a matter of fact, this obstacle has been prohibitive of successful operation of some of the most valuable properties, and all have suffered seriously from this handicap. The tunnel road will enable ore to be transported at a saving of $4 to $6 over existing rates. These figures tell the whole story. Mining men will appreciate the fact that a fraction of this difference would in many mines mean the beginning of dividends.

Hardly less important than the construction of the railway in the Bradshaws is the completion of the branch of the El Paso and Southwestern road, which connects Tombstone with the outside world. The Tombstone district, which in six years produced over $30,000,000 in gold and silver, was until recently reached only by wagon. In the days of its great prosperity every pound of supplies and every pound of ore destined for market had to be hauled at least 300 miles to the nearest railway point. The Southern Pacific finally came within 12 miles of the camp, but inasmuch as operations there had been stopped, owing to causes which I made plain in my report last year, no efforts were made to extend the railway to Tombstone.

The acquisition of all the properties in the district by a single company with large capital offered an inducement for the construction of a railway, and Phelps, Dodge & Co., who built the El Paso and South-

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western, threw a branch into Tombstone on their own initiative. Some time before the railway was completed the Tombstone Consolidated Mines Company had equipped the camp with a magnificient pumping plant and all the accessories necessary to modern mining, and a vast amount of ore was on the different dumps awaiting shipment. Tombstone, which had lain dormant for upward of fifteen years, began to take on new life long before the advent of the railroad, and now it is one of the liveliest camps in the Territory.

The famous United Verde mine, at Jerome, has undergone a complete renovation in the last year. The plant suspended operations for more than three months on account of a fire in the deep workings, which baffled all the efforts of the chemists to extinguish it. Experiment after experiment was made, with no appreciable result, the fire continuing to increase its area and to prohibit profitable mining. After a long series of experiments carbonic acid gas was introduced and finally extinguished the flames. The coal strike had not ceased when the fire was put out, and it was found to be impossible to obtain a supply of coke, so the works were shut down. There were fully 1,500 men employed at the time the fire broke out and the closing down of the mine worked great injuries to the town of Jerome, which depends entirely upon the miners for its prosperity. During the enforced idleness of the plant many improvements were made and the capacity has been increased to over 2,000 tons daily.

Although Senator Clark is extremely reticent concerning the United Verde, there is no doubt that it is one of the greatest copper properties in the world. The output for 1902 is estimated to have been in excess of 35,000,000 pounds. That amount is vastly less than the mine has produced in former years. With its increased facilities the United Verde output in 1903 ought to reach enormous figures.

In southeastern Arizona, where copper is king, the operations last year marked a distinct advance in methods and scope. The advent of Michigan miners in Cochise County means a great deal to the territory.

These men, who have made fortunes in the Michigan fields, made up their minds some time ago that Arizona possessed the richest copper belt on the continent, and their operations are on a scale that insures a tremendous output in the next few years. Experts tell me that the coming year is likely to see a complete revolution in the copper production of Arizona. While in 1902 there was a decided falling off in the production of copper, for reasons that I have stated, substantial improvements in the established mines and the approaching production of the new copper properties will give this territory a formidable rank among the copper-producing regions. The statement is freely made in Arizona that before many years the territory will occupy first place as a copper producer.

There are very few copper mines in the territory which do not produce gold or silver in marked quantities. The gold product of the United Verde, for instance, is popularly believed to go far toward paying the entire expense of operating the mine. Probably half a million dollars in gold is produced by the United Verde alone in ordinary years. As some of the greatest mines in the territory, producing both copper and gold, are hundreds of miles apart, the extent of the mineralization of the mountains of Arizona is apparent. With an abundance of water for mining operations, there is no wonder that the mountain regions are now being carefully prospected and that every few days stories of rich finds are being told. As in previous years some well-known mines were nonproductive last year by reason of litigation.

The Mammoth mine, in its day one of the great producers, was one of these. The Ray mine also was closed down. The famous Hillside mines turned out but a small quantity of ore. The Oro Grande, near Wickenburg, which last year caused such a decided sensation in mining circles by its tremendously rich yield, has been developed to a large extent and an effort is now being made to install a complete set of machinery sufficient for a mine of such growing importance. The Vulture mine, which produced $16,000,000 years ago, and which fell into new hands two years ago, was not operated last year.

It is estimated that nearly 140,000,000 pounds of copper were mined in Arizona in 1902. The production of lead was valued at about $500,000.

COCHISE COUNTY.

A chronicle of recent mining developments in Cochise County would afford striking revelations to thousands of mining men operating in less favored sections of the country. The improvements at the established mines and developments of new holdings presage a wonderful increase soon in the production of copper and the precious metals.

The leading districts of the county, enumerated in the order of their importance, are the Warren district, surrounding Bisbee; the Tombstone district, the Dragoon district, and the Huachuca district, in the Chiricahua Mountains. The leading mining properties are those of the Copper Queen Consolidated Mining Company, the Calumet and Arizona, the Tombstone Consolidated Mines Company, the Commonwealth, and the Black Diamond. There are many smaller propositions of merit.

The Copper Queen mine, which produces vast quantities of copper annually and considerable gold, is now engaged in the construction of large smelting works at Douglas, which will be completed before this report is in print. The plant will have a daily capacity of 1,800 tons, and the engines will represent 3,000 horsepower. The Copper Queen has just opened rich deposits in a new claim called the Lowell, and other new claims show much promise at a depth of 800 feet.

The Copper Queen is the pioneer mine of the Warren district, and for twenty-two years has been a famous producer. It embraces several large groups of claims, and has more than 140 miles of tunnels and drifts, and several miles of subordinate workings, and it buried 11,000,000 feet of timber during the past year. The company operates a railroad which connects it with the Southern Pacific at Benson. It employs about 1,800 men, and provides model accommodations for them.

The principal producers of this company are the Czar, Holbrook, and the Spray. The Lowell, a newly opened claim, recently has been put on the footing of a substantial producer, and the Gardner is in promising ore at the depth of 800 feet. On the Spray, the Holbrook, and the Czar the amount of rich ore raised excels everything in the history of that wonderful mine. This company is planning the installation of a number of exploration hoists in its undeveloped properties in the same district. In addition to these operations the Copper Queen Company has fostered numerous small development enterprises now operating in the same field.

Michigan capital recently has brought about some remarkable transformations in the mining aspect of Cochise county. The leader of the Michigan innovation is the Calumet and Arizona Company. After a development of only two years it has opened holdings which are now furnishing 275 tons of rich ore for reduction daily, and 56,000 pounds of blister copper represent the proceeds of one day's reduction. Such results have never before been approached in Arizona. The smelter is located at Douglas, Ariz., and its capacity will be doubled very shortly. When running full blast 750 tons of ore will be reduced every day and copper will be made at the rate of 3,000,000 pounds per month. The company is equipped with the finest hoist in the territory and has splendid railroad facilities, ore bins, and other improvements found necessary in operations conducted on a most elaborate scale.

The Calumet and Arizona has acquired extensive mineral groups in the vicinity of Bisbee. Its most important producer adjoins the Copper Queen.

The Calumet and Pittsburg is owned by Michigan people, but it is not identified with any other Calumet combination in Cochise county. It is down 900 feet with considerable drifting on that level. There is much copper ore in sight with unfailing signs of a big ore body.

The South Bisbee is controlled by the Calumet and Arizona. It has two shafts, which are down about 800 feet, and plenty of water is available. These properties are also located near Bisbee.

The Calumet and Bisbee was recently organized, with a group of 14 claims adjoining the South Bisbee. It is an independent company and has just commenced standard development operations.

The Calumet and Cochise is the latest Michigan combination to enter the field. It has also 14 claims adjoining the Calumet and Bisbee and will begin development work immediately.

The Mitchell properties, in Montezuma Canyon, 28 miles west of Bisbee, are controlled by Michigan capital.

The most prominent undeveloped mines in the Warren district are the Copper Glance, 9 miles southeast of Bisbee, with a 500-foot shaft and splendid surface prospects; the Modern, about 8 miles northwest of Bisbee, down 200 feet with a 200-foot drift on the lowest level and very excellent prospects in the drift; the Cochise, with a 350-foot shaft and considerable ore in sight, the property being mostly in the town site of Bisbee; the Copper King of Arizona, on the edge of the camp, down 625 feet; the World's Fair, 2 miles east of Bisbee, down 450 feet, with rich carbonates of copper in sight, and the Bisbee West, one of the outposts of the district, which is down 280 feet.

The Tombstone district, which came into its present ownership more than a year ago, is undergoing a wonderful transformation. The completion of the railroad places the Tombstone mines in the ranks of Arizona producers, and, from this time forward, it is believed the output will increase at a remarkable rate. It is worthy of note that as depth is attained the gold values increase measurably. When these mines were first opened years ago they were regarded as silver mines, and very few of the operators had any idea that one day Tombstone would be regarded as one of the greatest gold camps in the country. There are about thirty mines included in the consolidation, to say nothing of many claims; and some of these, notably the Contention, show gold values exceeding $100 a ton. The Lucky Cuss, another old-time property, runs above $35 per ton in gold. The average gold product of the consolidated mines exceeds $40 a ton.

The Tombstone Consolidated Mines Company, Limited, after having secured title to practically all of the valuable claims of the Tombstone mining district, is engaged in pushing the work of reopening the mines below water level as rapidly as possible. A large central drainage shaft, measuring 7 by 22 feet inside the timbers and having four compartments, is being sunk. During the year this has been equipped with powerful direct-acting hoisting machinery and with a thoroughly modern pumping plant of large capacity. Steel buildings and a steel gallows frame have been erected, and in all respects the plant is of thoroughly modern type and embodies all of the improvements which experience in work of this kind has shown to be of value. The pumps are of nominal capacity of 2,500,000 gallons per twenty-four hours, but capable of being forced up to 3,000,000 gallons without danger. Sinking below water was begun in December, but owing to the impossibility of securing a continuous and adequate coal supply—owing to the congestion of the railroads—was suspended until January 1, since which time it has proceeded rapidly and without interruption. The amount of water met with varies greatly from time to time, and the maximum rate of pumping up to this time has been about 2,600,000 gallons, which was easily taken care of by the machinery.

While it is from below water level that the chief product of the mines is expected to come, there are, however, many large blocks of ground above the water which are known to be ore bearing, and these the company is now engaged in systematically exploring with excellent results. Several very valuable ore bodies have already been opened above the water level by this work.

The working shafts of all of the principal mines of the district have been thoroughly overhauled, and sinking in them will be commenced and prosecuted as the recession of the water permits. The fissured character of the ground below water level seems to permit of successful drainage of the entire district from one shaft.

The Tombstone ores above water level were practically all completely oxidized and were formerly treated by the pan amalgamation process, followed by concentration, the concentration being smelted. Undoubtedly, from information already obtained by the sinking work in progress the oxidation will extend to a considerable distance below water level, but it is to be expected that at some point the ores will change to sulphides. For this reason it is not intended by the company to erect reduction works of any kind until the average character of the ore below water level and the process best adapted for its treatment are known. The ores are of very high grade and admirably adapted to smelting when suitable mixtures can be obtained. It will therefore be to the company's interest to ship such ores that are met with in the preliminary stage of the work and which it is necessary to remove from the mines to custom smelters at either Douglas or El Paso. Railroad connection with these points and the desirability of the ores make it possible to do this with great economy. A large increase in the proportion of gold to silver in the Tombstone ores is noticed near and below the water level, so much so that in many cases they should be classed as gold rather than silver ores.

Another well-known property in Cochise County is the Commonwealth Mine at Pearce. It is one of the heaviest gold producers in the Territory, and last year its product of silver reached exceedingly large figures. The silver is of such rich quality that even at the prevailing price it was marketed at a profit. The damage wrought by the fire over a year ago has been thoroughly repaired, and the mine is generally regarded as one of the best paying gold and silver properties in the Southwest.

In the Dragoon Mountains is also located the Black Diamond, a copper property, on which has been erected a 100-ton smelter. The mines comprising this holding are regarded as very productive.

The Huachuca district is practically undeveloped, but its mineral possibilities are being recognized, and several important plans have been evolved which look to a thorough prospecting and development of the Huachuca Mountains. The Chiricahua Mountains are even more remote and thus far have had but little development. But the Rincon ranges in the extreme north end of the county have enlisted considerable capital lately and rich copper values have been discovered.

COCONINO COUNTY.

As in the preceding year, all mining operations in this county were confined to the Grand Canyon district. As I said in my former report, there are undoubtedly very many richer properties in this county, but until the completion of the Grand Canyon Railway their successful development and operation was rendered extremely difficult.

There have as yet been no shipments of ore worth mentioning, but prospectors are busy, and it would not be surprising to hear any day of a great discovery.

The Cameron mine is considered to be a very fine prospect, but up to date it has not developed anything sensational.

GILA COUNTY.

The Globe copper district made a very commendable showing in 1902. The ores of the Globe district may be classed as free-gold ores, native silver, or silver-lead ores, both of which play an insignificant part in the mining industry of the region and cupriferous ores containing varying amounts of the precious metals. It is to the copper ores that the district owes its life. The copper ores may be divided into oxidized ores and sulphide ores. To the oxidized ores belongs nearly all of the ore produced in the district up to this time. Sulphide ore, with occasional exceptions, is practically of recent discovery, and is a factor of increasing importance in determining the future of mining operations in this distict.

The district comprises about 250 square miles and is situated in the southeast-central part of the Territory. It really includes a portion of Pinal County. Prior to 1874 this region was so isolated and so thoroughly overrun by the Apaches that prospectors found it convenient to overlook it. But in those years a party of prospectors managed to locate the Globe claim, now part of the Old Dominion mine.

About the same time the famous Silver King mine was also located. The first finds were of silver, and this was regarded as a distinctively silver region up to the time the silver industry began to decline. The Silver King mine produced vast quantities of the white metal, which was transported in ore-wagons across the desert to the Southern Pacific Railway.

It seems strange that in view of the present prominence of copper as the principal product of the Globe district no thought of the red metal appears to have entered the minds of the operators during the life of the silver boom. The very mines which subsequently became the largest producers of copper at one time were worked for silver. After 1881 the value of the copper deposits began to be generally appreciated, and by 1884 the Globe mine, now known as the Old Dominion mine, was in full operation. For the first four years after it became regarded as a copper mine its yearly average was nearly 6,000,000 pounds. The Old Dominion Copper Mining and Smelting Company is now in a very healthy condition and its product last year made a very handsome showing. It is estimated in a recent Government publication that up to the close of 1901 the total production of the Globe district was about 120,000,000 pounds of copper, of which the Old Dominion mine produced more than three-fourths. The United Globe mines, under the control of the United Globe Mining Company, comprise the Grey, the Buffalo, the Josh Billings, the Big Johnnie, the Buckeye, and the Stonewall. The products of these mines last year were shipped partly to the Copper Queen Consolidated Mining Company, at Bisbee, and partly to the El Paso Smelting Works, at El Paso, Tex.

GRAHAM COUNTY.

The southern end of the San Francisco Mountains, reaching to Graham County, contains vast copper and other mineral deposits that have been developed to the point of justifying sanguine mining men in expressing the opinion that at no distant day Graham will be the banner mineral county of Arizona. It was only a few years ago that some of the most astute mineralogists of the county declared this section to be almost barren of mineral. The more liberal experts believed in the existence of considerable mineral, but they did not believe it existed in paying quantities or was distributed in a manner to render mining profitable; and until within a very few years the mineral output has been inconsequential. In fact, some of the pioneer companies were "wild-cat" concerns which had little or no confidence in their own enterprises. But those unstable organizations surprised themselves and confounded experts and the mining world generally in unearthing mammoth deposits of copper.

For seven years the copper production has increased by vigorous strides. Frequently the product of the Clifton-Morenci district has been overstated, even by conservative official reports, but a strict adherence to the truth tells a tale of healthy development. The possibilities are even more roseate.

The district enjoys the distinction of employing the most economical reduction processes in vogue in the Territory. The leaching process is used in the treatment of large quantities of ores of such combination that they readily yield to that method of reduction.

James Colquhoun, superintendent of the Arizona Copper Company, was the inventor of this economical scheme of ore reduction, and he has reduced the treatment cost so that it is now on a par with the most economical processes in use in the Lake region. The heavy percentage of the ore found to be available for profitable reduction runs between 3 and 5 per cent in copper.

The Clifton-Morenci district already outstrips the other copper sections of Arizona in the production of the red metal, and contains areas of mineral ground whose constant product compares favorably with the output of similar areas in any other part of the world. The copper holdings of three leading mining companies adjoin each other, physically forming one mine whose production surpasses that of the famous United Verde mine at Jerome. The district that embraces these valuable holdings is confidently expected to double its output within a very few years. This copper district is unlike other copper regions in Arizona in that in no instance is gold affiliated with copper in the copper mines. But the future holds out good prospects for explorations for gold and other minerals in other than copper districts.

The most valuable mining property in Graham County is that of the Arizona Copper Company of Clifton. The copper production increased 33⅓ per cent during the year, but ruling copper prices reduced both the gross and the net receipts. The company makes more than 1,200 tons of bullion per month, most of which goes through two 500-ton concentrators, one located at Clifton and the other at the Longfellow claims, within a few miles. The increase in production has been due to additions and improvements in the reduction plants. Power for the operation of the works is furnished by a large battery of gas engines. With the exception of a few days devoted to the installation of new machinery, the mine continued during the year its record of constant operation.

The Detroit Copper Company, a subsidiary corporation of Phelps, Dodge & Co., of New York, has extensive copper holdings at the camp of Morenci which are holding their place among the chief copper producers of the Southwest. The company is equipped with a smelter having a daily ore-reduction capacity of 40 tons and a 500-ton concentrating plant.

The Shannon mines, operated by the Shannon Copper Company, were added to the producing list early in the year and they were operated constantly, except when operations were suspended to admit of the erection of a concentrator which will materially increase the output. The mines are equipped with a 300-ton smelter, as well as the concentrator, and when in full blast the copper making will reach 30,000 pounds daily. The development of these holdings has opened large new ore bodies recently and leads to the conclusion that still greater deposits will be encountered.

The New England Copper Company, which has opened very promising ground, adds much impetus to the development of the district. The company is backed by Boston financiers and is participating in the most active development. The owners propose to erect a large reduction plant and to build a railroad from Clifton to their other smelting site. Surveys for this road have been completed. The site is located three miles from Clifton on the San Francisco River. This company has ores on the dumps whose gross values are estimated at a quarter of a million dollars.

MARICOPA COUNTY.

Mining operations in this county were restricted to development work in the year just passed. The Phoenix mine, of which considerable was expected, was bothered by lack of water most of the year and its product was inconsiderable. It is the possessor of a monster ledge of low-grade gold ore, and with the improved outlook for an abundant water supply the company should make a good showing in 1903.

The Relief mine, in the foothills of the Bradshaws, has been extended during the year with excellent results. Water has been encountered in sufficient amount to warrant continuous operation. The operators have plenty of money and there is good ground for the statement that in a year or two the Relief will rank as a big gold producer.

Nothing was done toward the reopening of the Vulture mine, which years ago produced over $16,000,000. The property is considered to be a good one, but considerable money will be required to place it in productive condition.

There was more than the usual amount of prospecting in the county, and as a result several properties are likely to attract attention in the near future.

MOHAVE COUNTY.

The principal mines in Mohave County on the list of producers during 1902 are the Tennessee, Elkhart, Minnesota, Connor, Lucky Boy, Golden Gem, C. O. D., San Francisco, Gold Roads, Leland, and the Ratan, at Fort Mohave.

These are mostly gold properties, with the exception of the Tennessee, Elkhart, and C. O. D., a good percentage of the values in which are in lead and silver.

The most remarkable achievement in mining development in Mohave County in 1902 was in the Gold Roads district, where hundreds of thousands of dollars have been invested in the development of promising prospects. This fact is due principally to the wonderful showing made in the Gold Road mine, in a comparatively short space of time.

Less than three years ago the sheriff of Mohave County grubstaked a Mexican named Juan Jerez, who located the Gold Road claim and its two extensions. With two 10-foot shafts sunk on the vein at a distance of 3,000 feet apart, the claims were sold for $50,000. The showing with even such superficial workings was remarkable, the ore averaging $300 to the ton in gold the entire width of one shaft and more than $100 in the other. The purchasers prosecuted considerable development on the property and in less than one year sold to an eastern company for $250,000 who, in turn, after continuing the work of exploration for another year, sold to a French-Swiss syndicate, the consideration being $500,000. The present owners are operating the mines on an extensive scale and have installed a large reduction plant.

The opportunity for immense placer operations on the Colorado River, both in Mohave County and across the river in the State of Nevada, depends upon securing cheap motive power. The largest hydraulic placer plant in the world was installed at Temple Bar, Mohave County, by a wealthy syndicate of French capitalists, three or four years ago. The only fuel available was coal, which was transported at a cost of $40 a ton laid down, and which expense would not justify continuation of operations. If electric power should be generated eventually by means of a dam on the Colorado River, the gold production of Mohave County would be materially increased by placer operations along the river.

PIMA COUNTY.

Pima County is preeminently rich in mineral. Mining has passed the speculative age, but still is in its infancy, and the mining wealth of Pima County is in the future. Development is in progress in hundreds of properties, but no mine yet has reached the stage of profitable production.

Among the districts of great natural mineral resource is the Empire mining district on the eastern slope of the Santa Rita Mountains. Gold, silver, and lead ores in rather large quantities are available there for shipment.

The Rincon district embraces a long spur of the Rincon Mountains and is producing copper, gold, and silver to some extent.

The Quijotoa district lies about 90 miles west of Tucson. An excellent wagon road leads from the town to the camp where several gold, silver, and copper mines are producing in good quantities. Dry placer beds in that vicinity are also yielding fair returns of gold.

The Oceanic Gold Mining Company is operating claims in the Arivaca district, 70 miles south of Tucson. The 21 claims in this group have been consistently developed during the past three years. The mine is equipped with a Merralls quadruple discharge mill which handles 24 tons of ore daily, and a hoisting plant employed in putting down a shaft 2,000 feet in depth. At a depth of 250 feet the ore holds strong.

The ores are silicious and impregnated with iron and carry only gold. About $120,000 worth of ore has been blocked out. The vein is about 2 feet in width and runs from $10 to $35 to the ton. The geological formation indicates that the mine will improve in value with depth, and mining men regard this property as a producer of coming importance.

It is said that the "Old Boot" mine at Silver Bell will resume operations shortly. This is one of the most important mines of Pima County. It has been held on the market at $750,000. About 150 men were employed at the camp when the mine closed down. It is a copper proposition with gold and silver values.

The Silver Bell district is somewhat celebrated as a copper camp. It is about 46 miles west of Tucson. A large number of mining companies are now operating in this section. Copper, gold, silver, and lead exist in large deposits.

The Sulphide camp is a fairly good gold, copper, lead, and silver producer. A good wagon road now leads to the Silver Bell region from Tucson and thence to Sulphide, a distance of 30 miles.

The Yuma district is located 18 miles west of Tucson on the Silver Bell road. The district extends around the base of the Tucson Mountains, covering a number of lead, copper, gold, and silver claims, which are in process of development.

The Amole region, on the west side of the Tucson Mountains, is reached by a wagon road via Robles Pass, passing Musk Hog Mountains. Here some silver, gold, and copper is being extracted.

The Saginaw district lies 9 miles southeast of Tucson. Within the district are several well-known mines. Extensive operations are being carried on at the established holdings.

Olive camp is acquiring fame for its high-grade silver producers. It is located about 20 miles south of Tucson and has the advantage of good roads. It is also favored with a variety of minerals. In the Old Baldy district W. B. McCleary is continuing development on the Jackson, Star Pointer, and Blue Bird, but the development has not yet reached the stage to justify the installation of reduction works.

Among the districts where development is in progress are the San Xavier, Rosemont, Black Horse, Blue Jay, Andrade, Treaterville, Helena, Gunshot, Sierrita, Papago, Gijas, Baboquivari, Cababi, Schumacher, and Condon.

PINAL COUNTY.

The damage to the mining interests of Pinal by the cessation of work at the Mammoth mine was not entirely repaired during the year, the Mammoth being still closed by reason of litigation. It is conceded that the Mammoth is a fine property, which may account for the tedious court proceedings. When it was in full operation more than 1,000 men were employed and the output cut a decided figure in the gold totals. There was some good development work done in the Pinto Creek region last year, and the region about Florence was the scene of considerable activity. By the time of the next report the Phoenix and Eastern Railroad will have reached Florence and mining in that vicinity will have received a decided impetus. Up to this time the lack of transportation facilities has operated to keep the district in the background.

In early days, when the Silver King was a famous producer of the white metal, the returns were sufficiently rich to warrant the long haul across the desert to the Southern Pacific. The Silver King has been inactive for years, but the advent of the railroad may induce capital to take hold of it again, as it is a distinctly high-grade property. The mining districts of Pinal have been well developed, considering the drawbacks to economical operation, and should have some good producers in the coming year.

Pinal, like other counties, suffered severely from the drought last year. Several companies which had provided smelters and stamp mills were obliged to shut down through the failure of their water supply.

Santa Cruz County has advanced perceptibly in mining, and prospecting was never more active than in 1902. Outside capital has been slow to enter this field, but the whole county is richly mineralized, and recently considerable capital has found its way into the region.

The principal mining districts are Washington Camp, Patagonia, Harshaw, and Oro Blanco.

The most productive and important of these is Washington Camp. The ores of the belt comprise copper, iron, lead, and silver. In this belt are located the Pride of the West, the mines of the Duquesne Mining Company, the mines of the Century Copper Company, the Poole group, and the Belmont.

The Pride of the West has enlarged its plant and is now equipped with the most perfect plant in America for the reduction of the ores encountered. The ores contain sulphide of copper, zinc, and galena, with considerable silver. The greatest width of the vein is 30 feet.

The concentrating mill and the smelter have been remodeled and doubled in capacity. The mill now contains 2 crushers, 5 sets of rolls, 9 Whifley tables, and a roasting furnace. Twelve dynamos have been installed. The dynamos are heavy brass machines whose belts are charged with electrical currents. In passing over the crushed ore the belts pick the copper out of the waste and deposit it in sacks. These machines are called magnetic separators and are covered by patent. The process is new and was introduced by Emerson Gee.

In the mill the ore first is pulverized dry, then roasted, and after cooling is passed through magnetic separators that extract the copper and iron. The tailings are then carried to Whifley tables, where the lead carrying silver is separated from the zinc and silica, the tables making three products—the galena, carrying silver, the zinc carrying some garnet and silica, and silica that is almost pure. The second product is redried and again passed through magnetic separators of different intensity of power, and the zinc is parted from the garnet and silica, giving a high-grade zinc product. The copper and iron concentrates are carried into a reverberatory furnace, where a high-grade copper matte is produced by the use of wood and crude oil for fuel.

The company is treating about 100 tons of ore daily. With its new machinery in operation about nine months it recently paid a dividend amounting to $15,000.

The Duquesne mine has not yet resumed operations, and the officers of the company have found it impossible to apply themselves to the development of the mine. The holding is one of the most valuable in Santa Cruz County, and when the operators find time to devote to the enterprise they will add an important property to the list of producers. It has undergone extensive development and satisfactory experiments have been made with the ores, which are similar to those found in the Pride of the West.

The Copper Century, located near the Duquesne and the Pride of the West, is all ore. Development has been carried forward with steam hoists. The Copper Century embraces the old Belmont property, in the old workings of which are exposed large deposits of copper.

From Washington Camp to Patagonia Station, on the Sonora railway, a distance of 18 miles, are several mines in various stages of development, some of them very rich. Among them is the Mowry property, discovered and operated prior to the civil war. During the war ore from this mine was smelted at the mine, and the lead was shipped overland and melted into bullets used by the Confederate army.

The American, Blue Nose, French, and Alta are other silver-lead mines in the same region which have been extensively operated in the past and upon which operation will be resumed shortly. The Hermosa, a silver mine which has produced $1,500,000, is being reopened. The Hardshell, a silver-lead proposition, continues to ship heavily.

The World's Fair, a silver-lead mine which also carries gold, ranks among the first mineral producers of Santa Cruz County. It has been producing for ten years intermittently. The assorted ores run from $15,000 to $20,000 to the carload, and are so rich that the owner has preferred to ship the rock directly to a custom smelter instead of erecting his own reduction works and producing on the elaborate scale of which the mine is capable. The owner once refused $500,000 for his property. Under elaborate and careful operations the mine would repay cost price within a year.

At Patagonia is situated a sampler and smelter, each with a capacity of 80 tons per day, which are not in operation at present. Northwest of Patagonia Station, in the Santa Rita Mountains, is situated the Santa Rita Consolidated Mining Company's group of seven claims, the shafts varying in depth from 150 to 350 feet. At the greatest depth a new body of ore has been struck that shows permanency and fairly good values. All the mining property of this district consists of silver-lead ores, with a percentage of copper.

Adjoining this company's properties is the Wandering Jew mine. There is an immense ledge of silver-lead ores, developed by three shafts, a tunnel, and an open cut 250 feet long, all in ore averaging 50 per cent lead and from 10 to 100 ounces in silver to the ton.

The Eureka and Darwin mines are about 2 miles south of the Santa Rita Company's mines. Some fine bodies of ore were recently uncovered in these holdings and the camp in general is very promising.

The nearest mine to Nogales, on the international line, is the Uncle Sam, situated 5 miles northeast of the town and is managed by G. A. Lonsbery, of Nogales. The ore carries gold and silver with a little copper and lead. The development has been meager, but rich ore in shipping quantities has been taken out recently.

Adjoining the Uncle Sam, with the same character of ores, is a group of claims owned by the Grant Mining Company, on which considerable development work has been done, but operations have been suspended.

About 12 miles northeast of Nogales is the Buena Vista mine, owned by the Nogales Mining Company, on which extensive development work has been done, including a shaft 500 feet down from the apex of the vein, upon which active work is still in progress. The ores are gold, silver, and copper, and the company is preparing to erect a smelter near the mine. The same company also owns the Pena Blanca mine, located about 12 miles northwest of Nogales. It carries high-grade silver and lead rock. Considerable development work has been recorded.

Northwest of Nogales about 35 miles is the Oro Blanco district. At the extreme southwest corner the Arizona Hydraulic Mining Company has put in a dam with the object of utilizing neighboring placer ground in the gulches, all of which contain good auriferous dirt and have been worked profitably in a primitive manner by Mexicans during the rainy seasons.

In this district also are El Oro, Tres Amigos, the old Ora Blanco, Gold Bug, Old Glory, MacDonald group, Maloney, Montana, Yellow Jacket, Austerlitz, and others. These principally are gold properties, but the Montana and Maloney carry gold, silver, and lead. The Tres Amigos was recently sold, and work has been resumed in the Old Glory. The Oro Blanco group was bonded to a strong financial concern that is preparing to put down a 500-foot shaft and work out other much-needed developments. This property is a producer of gold and silver ores of high grade.

Three miles from the Maloney mine is the Old Bextrom mine, one of the antiguas, or ancient Mexican holdings. Out of two holes—one 70 and the other 85 feet in depth—50,000 ounces of silver have been taken out. The ore is in pockets and kidneys, some of which is almost native pure silver.

The Austerlitz and neighboring mines have produced about 1,500 tons of ore, the average assay being $14 in gold to the ton.

The Jelisco copper mines are located about 7 miles northeast from Oro Blanco. They comprise a group of eight claims, showing extensive copper leads, carrying also silver and some gold. The development amounts to 500 feet.

In the Santa Rita Mountains the Calabasas Copper Company, which opened several copper claims and equipped itself with a 60-ton smelter that was running for more than a year, has suspended operations.

YAVAPAI COUNTY.

Yavapai enjoys the distinction of being the largest gold producing county in Arizona.

There are 60 stamp mills on the assessment roll of the county and five 40-ton roller mills; 7 smelters, in addition to the great plant of the United Verde Copper Company; 3 steam shovels and half a dozen cyanide plants. There are also 85 hoists, including steam and gasoline, and most of them are in active operation.

The stamp mills are divided as follows: Fourteen 5-stamp, thirty 10-stamp, one 15-stamp, ten 20-stamp, one 40-stamp, and one 80-stamp, the two latter being at Octave and Congress, respectively.

New reduction plants on various properties that have been in active course of development during the year have been installed as follows: Oro mine, 20-stamp mill and cyanide plant; Iron King, 200-ton capacity mill; Golden Link, 20-stamp mill; George A. Treadwell Company, oil smelter, 100-tons capacity; Standard Smelting and Refining Company, 50-ton concentrating mill; Monte Cristo, 5-stamp mill; Cash mine, 10-stamp mill; Gold and Copper Consolidated, 50-ton cyanide plant; Mohawk, 20-stamp mill; Brooklyn, 10-stamp mill; Seaton, 10-stamp mill; Oriental, 40-ton roller mill; Victor, 40-ton roller mill; Blue Dick, 30-ton smelter; Catocton, 10-stamp mill.

Mines that were in operation in 1902 and that are worthy of mention as gold producers are the Congress, Octave, Mudhole, Oro Grande, Henrietta, Iron King, Iron Queen, Empire, President, Rockefeller, Dividend, Victor, Express, Fitzhugh Lee, Home Run, Bannie, Blair, Crook, Catocton, Leviathan, Oro, First Home, White Horse, McCabe, Mohawk, and Boaz.

Copper producers in active operation in 1902, and on most of which development work was accomplished, were the Brookshire, Cliff, Butternut, Decatur, Yaeger Canyon, Copper Prince, Blue Bell, Copper Cobre, and Big Bug.

Other properties in the county that are capable of large production and on which operations are likely to be resumed shortly are the O'Brien, Hillside, Planet-Saturn, Johnson, Little Jessie, Mescal, Crown Point, Senator, Gopher, and several others.

Articles of incorporation of 169 companies were filed in the county recorder's office during 1902, 150 being mining corporations.

Renewed activity in placer mining has taken place with new and improved machinery of large capacity, and old placer diggings from which millions of dollars were extracted in early days by crude and primitive methods are being worked over on an extensive scale, with the most satisfactory results.

The greatest project in the interest of the mining industry in Yavapai County was the formation of the Fossil Creek Power Company for the purpose of developing and transmitting electric power, using the waters of Fossil Creek, at the extreme eastern edge of the county, for generating the electricity. The entire bond issue was placed in 1902, and the company has already contracted to supply 4,000 horsepower, at $100 per horsepower per annum, to various mining companies operating in the county. It is said that the Fossil Creek Company is to supply the power also for the United Verde Company, which is claimed can be done at a saving of at least one-third of the present cost.

The city of Prescott, the county seat of Yavapai County, and the natural distributing point for the mining districts, has doubled in population in the past two years and now has between five and six thousand residents.

Some twenty new business blocks have been erected by local capital at a cost of over half a million dollars; the two bank buildings and equipment alone costing more than $100,000. As Prescott depends entirely upon the mining industry for its support, it is evident that the bankers and business men of the city have every confidence in the great future in store for Yavapai County through the development of its vast mineral resources.

The property known as the Mudhole, belonging to the Penn Gold Company, and located at Walker, near the head of Lynx Creek, is the largest gold producer in the immediate vicinity of Prescott. The ores are soft and the values are saved entirely by concentration, three 40-ton Huntington roller mills being employed during 1902. Lack of sufficient water was all that deterred the installation of reduction works of double the capacity of last year, but an abundant supply was recently struck at the lower level, and the output will probably amount to 500 tons daily in the near future.

The main shaft on the Mudhole is down 560 feet and the drifting done on the different levels amounts to a total of more than 3,500 feet. The company is at this writing sinking a new double compartment shaft which is to be continued to a depth of at least 1,000 feet, with a body of ore on the hanging wall from 5 to 13 feet in width and similar veins on the foot wall. Between the ore bodies is a mineralized porphyry filling containing small values. About seventy men are employed on the property.

Another property which appears to have a bright future is a group of claims on the opposite side of Lynx Creek, directly northwest and only a few hundred yards distant from the Penn Company's holdings. The owners have abundant capital, and development work is proceeding rapidly. It is believed that these properties will be substantial producers the coming year.

The property of the Poland Mining Company, which is beginning to attract much attention, consists of thirty-seven claims, practically covering all of the ground between the Lynx Creek, or Walker, and the Poland mining camps. The company has done a very large amount of development work on the Poland vein and is now operating a 20-stamp mill on ore from that vein. The mill was started in March, 1902, but owing to the inadequate water supply was closed down until December, when a sufficiency to permit of the continuous operation was secured and milling was again resumed. The product of gold and silver was extremely satisfactory, considering the short time the mill was in operation. There is ample foundation for the claims of the company that the present year will show a most satisfactory record of production.

The cross-cut tunnel connecting Poland and Walker penetrates ground containing many valuable veins, some of which were prospected to a considerable extent in former years from the surface and can not fail to add enormously to the resources of the company as the veins will be cut at depths ranging from 500 to 1,000 feet.

The expense of the tunnel would be amply justified by the promise of the veins on the surface which makes it certain that the opening of the tunnel to the Lynx Creek traffic will prove highly profitable. Prior to commencing work on this tunnel it was predicted by those familiar with the property that larger bodies of ore than those known to exist would be encountered during construction. This prediction has already been justified, one vein in particular having recently been cut which promises to be extremely valuable and sufficient in itself to make an important mine. The company's mill is well equipped, and consists of 20 stamps with all the necessary corresponding machinery and equipment. By the time the tunnel is completed through the mountain the mill capacity will have been increased to 100 stamps, if present plans are carried out.

The Hoyt Mining Company has commenced extensive work on a group of five claims on Lynx Creek.

GROOM CREEK DISTRICT.

For four or five years there were comparatively few operations on Groom Creek, of which Lynx Creek district is practically an extension. It was impossible for prospectors owning claims in that section to sell their properties or procure money for their development. The first actual development of any consequence was started on the Empire mine, and as soon as that property became a producer the locality was recognized as a mining district of great possibilities. One after another the Groom Creek claims were taken hold of by men backed by ample capital, and to-day there are a dozen steam hoists in operation and three or four stamp mills pounding away on good grade ore.

To Prescott, Groom Creek is the nearest scene of active mining. It contains hundreds of small properties, many of which are destined to become important producers. The Victor, Midnight Test, Home Run, Monte Cristo, Gold Basis, Empire, Infanta, Behm, the Slack mines, the Coon property, the Benjamin, the Rice claims, the properties of Laird & Brow, the Noland and the Riley properties, the Webfoot, Silver Flake, Nil Desperandum, the Stemwinder, the Search Light, the Star Light, Wann & Doran's properties, E. M. Clark's group of patented claims, the Oakdale, and various others are properties of good prospect in Groom Creek district. Some of them are being extensively developed, and already several of them are among the best producing mines of Yavapai County. Mining men are enthusiastic over this and the Lynx Creek district, which are almost one, and they look forward to many producers which, before many years, will form a district rivaling some of the liveliest in Colorado.

The Lynx Creek, the Groom Creek, and the Big Bug districts were much maligned before there sprang up some very good producers. They were admittedly rich in placer gold, 90 per cent of which was taken from within the limits of a 6-mile square which now bids fair to be the scene of more activity in mining of a more stable character and a source of greater yield of other precious metals than gold, than any other section of like area in Arizona. Not only do the placer streams have their source in the mountains clearly within the confines of this limited section, but the richest deposits of gold were found inside its borders. It is a matter of record that Lynx Creek alone has produced more placer gold than all the other streams of Arizona combined. Responsible for this is the fact that in no part of Arizona does there exist a region so threaded with gold-bearing veins and leads as that immediately tributary to these creeks.

BIG BUG DISTRICT.

The Big Bug district affords other instances of a rich mining region which has been neglected. The Prescott and Eastern Railroad taps the Big Bug. This railroad has created its own business by affording an opportunity for small mine owners to ship their ores to smelters. The line has been a dividend payer from the start, while it has begun a work for the region which it serves which inevitably must culminate in a great mining industry. Mines are opening rapidly. Already so much ore has been developed that a well-equipped custom smelter has been installed and for several months has been treating ore.

The placer fields tributary to Providence are very rich, yet quartz mining appears to be the most prevalent. Between the Poland mine and Big Bug post-office, a distance of about 3 miles, with the town of Providence at a central point, there are no less than a dozen big mining properties. They include the Poland and the Butternut. Other properties in that vicinity are the Mammoth, Great Belcher, Lottie, Annie, Sterling, Red Rock, Cypress, Henrietta, Golden Wreath, Eugenie, and Gopher.

The Mammoth and Great Belcher both have hoisting plants and considerable improvements and in the development they have attained a depth of 700 feet.

On the Postmaster and New Erie properties a 6,000-foot tunnel is being driven through the mountain. The Annie has attained a depth of 300 feet and the property is supplied with a 10-stamp mill and other improvements. The Henrietta, operated by the Braganza Gold Mining Company, has produced many thousands of dollars. It has shafts and other workings amounting to several thousand feet, and the improvements include a 20-stamp mill, concentrators, hoists, and pumping plant.

A newly opened property of unusual promise is the Butternut, owned and operated by the Butternut Gold and Copper Mining Company. One of the claims—the Golden Wreath—is situated on the divide between Chaparrai and Galena Gulch, and is a southwestern extension of the famous Little Jessie mine. The company at present confines most of its work to the Butternut, from which a carload of ore is shipped every few days. The Butternut is in a great mass of ore, most of it black. In one place the vein narrows to 2 feet, but it quickly widens again to the average width of 4 feet of solid ore, which frequently widens to 6 feet.

The mine is equipped with one of the best gasoline hoists in northern Arizona, as well as winzes. The machinery is all snugly covered with frame buildings. The greatest depth attained is 300 feet. Thousands of tons of ore have been taken out of this property, all of which was shipped and milled at a good profit, despite heavy transportation charges. The mine now furnishes about 150 tons per month to the custom smelter near by, and very shortly it will double that production.

The Little Jessie mines are among the most important in the Big Bug district. One group comprises three mines—the Little Grace, Little Jessie, and Ella, with a total length of one continuous vein of 3,000 feet. The other group, 1 mile distant, and operated by the Little Jessie Mines Company, is known as the Mount Elliott group, comprising four full and contiguous claims, called the Roosevelt, Teddy, Terror, and El Caney.

The Little Jessie mine, which is the central location of the three composing the Jessie group, and upon which most of the development work has been done, has already produced something like three-quarters of a million dollars, by actual mint and smelter returns.

The Val Verde smelter, which was erected several years ago in the Big Bug district, did a very satisfactory business in 1902, and is now undergoing improvements which include an 80-ton briquetting machine.

This, with the machine now running, will give the plant a total capacity for treatment of 110 tons of ore per day. Storage capacity for about 1,800 tons of concentrates is being added, together with additional storage room for about 1,000 tons of ore. It is probable that another jacket will be added in the near future.

The opening of the Bradshaw Mountains to railway facilities has caused renewed activity in that great mineral-bearing section, and extensive mining operations are in preparation. Such well-known properties as the Gladiator, War Eagle, Del Pasco, Wild Flower, Crowned King, Cadillac, and others that have been inactive principally on account of transportation facilities, but were famous for the richness of their surface ores, which stood the cost of long wagon hauls and expensive working charges a number of years ago, are to be extensively developed and operated again on a larger scale with new and improved machinery. Properties such as the Mohawk, Oro, Peck, Rapid Transit, Button, Boaz, Brewster, Oro Belle, and others are now being developed and equipped, a great deal of eastern capital having become interested in this section within the past two years.

The Development Company of America has leased, bonded, and otherwise occupied during the year 1902 a score of excellent mines in the Bradshaw district and has formulated plans for operations on what may be termed a stupendous scale.

THE CONGRESS MINES.

The Congress mines and mill have run steadily during the year, crushing the usual amount of ore and making the usual product. In December an additional 40 stamps, making 80 in all, were started and it is the intention of the company to keep this number in continuous operation hereafter.

The deepest workings at the Congress mine have now reached a depth of 3,500 feet on the incline of the vein, which averages about 22 degrees. The Congress vein is accompanied by a greenstone dike, the ore, which is white quartz, carrying iron pyrite disseminated through it, being generally found next the foot wall of the dike. The vein is remarkable for having been found practically continuous with only nominal dislocations to this great depth. It may be remarked that the general conditions and the appearance of the veins at the greatest depth differ very little from comparatively close to the surface.

The mine is almost dry and it has been found possible to so control the circulation of air between the different shafts as to secure good ventilation without artificial means. It may therefore be said that the limit of depth to which it will be possible to work this mine is not yet in sight.

In addition to the Congress vein described above and which is accompanied by the greenstone dike, the company has two other veins which are simply fissures in the granite country rock. Shafts have been sunk upon these to varying depths, the deepest being 1,300 feet, and showing continuous and very strong veins to that depth. These veins are larger than the Congress and their proved permanence in character gives promise of unusually long life to the mines.

About 380,000 tons of ore have already been taken from the mines and the reserves are being increased constantly by development work at a much greater rate than extraction, which is at present at the rate of about 8,000 tons per month.

The process of ore treatment at Congress consists in wet crushing with stamps, followed by concentration for the removal of the heavy sulphurets, which are shipped to custom smelters. The tailings are separated into two classes—the coarse sand, which are treated by the cyanide process raw, and the finer material or slimes, which are first roasted in a mechanical furnace and then also treated by the cyanide process. The total extraction from the orignal ore is thus made very high, always over 90 per cent.

THE UNITED VERDE MINE.

With the improvements made at the United Verde mine there is every reason to believe that the output this year will be much greater than that of last, inasmuch as the price of copper has increased. While the workings of this mine are closed to the general public and the miners are not permitted to go about the mine at will, there is little doubt that the ore bodies are very extensive. The stopes are of such phenominal width that the mine has been opened to a depth of 600 feet only and above the 600-foot level there are reserves sufficient to maintain production at the rate of 40,000,000 pounds per annum for some years, while diamond drill borings have shown the ore bodies to extend to a depth of at least 2,000 feet. The mine is a monstrous lense of sulphide ore and is practically a single stope, though necessarily subdivided to leave pillars for support. The very immensity of the ore body is proving a source of great trouble to the management, as the smelter and other important buildings have been constructed immediately over the mine and repeated caves have done much damage to the works on the surface as well as a number of shafts.

The theory for some time was entertained that the United Verde property embraced about all the copper-bearing land around Jerome. The mine employed about 1,200 workmen and was responsible for a camp of about 3,000. In the last two or three years, however, the United Verde has not alone been responsible for mining activity in the Verde district. G. W. Hull secured many thousands of dollars to develop adjacent holdings and on Mingua Mountain, 2 or 3 miles away, large ore bodies have been opened in the Iron King property and the Copper Chief, which adjoins it, and which is owned by Senator Clark. There are many other properties in the region under course of development; among them are the Verde King, the holdings of the Baumann Copper Company and those of the George A. Treadwell Mining Company.

YUMA COUNTY.

The two big properties in this county—La Fortuna and the King of Arizona—made excellent showings during the year. Both are gold mines and their value as stable producers has been fully established.

The main shaft of La Fortuna is down over 1,000 feet and the ledge continues to show satisfactory values. While millions have been produced here, there is no indication of a lessening of the golden stream. The tailings are put through the cyanide process, with a great saving in values.

Ever since the water problem was solved by the King of Arizona people the property has been operated continuously. The production last year was greater than that of 1901 and the vein gives promise of even better values. The King of Arizona is fast taking rank as a noted gold producer.

There was much prospecting in the county during the year but no noteworthy finds were made. Ever since Eichelberger discovered the King of Arizona in the desert, prospectors have striven to equal his good fortune, but up to date he occupies a niche of his own. And yet news of a like discovery would not cause the old timers in Yuma to wonder, for they have no doubt that the hills of the county contain a vast amount of treasure.

SOURCE OF PRODUCT.

	Fine ounces.
Gold:	
From quartz	199, 140
From placer	2, 100
Total	201, 240
Silver:	
From quartz	1, 837, 000
From lead ores	203, 000
From copper ores	1, 130, 000
Total	3, 170, 000

CALIFORNIA.

By Charles G. Yale.

The yield of precious metals in California for the calendar year 1902, as shown by returns from producers received at the mint of the United States in San Francisco, in answer to inquiries, was as follows:

Gold	$16, 910, 320
Silver	616, 412
Total	17, 526, 732

This shows a falling off of $78,724 in gold from the similar statement of the previous year. There is apparently a falling off in silver, due to the fact that in 1901 the silver product of the big copper smelters in Shasta County has been figured at coining value of the metal, while for 1902 it was figured at $0.5216, the average commercial value of the year. There was, nevertheless, a very material reduction in output from these smelters in 1902 owing to miners' strikes keeping the furnaces practically idle for some months. Owing to the reasons given the total output of the combined gold and silver of the State shows a reduced yield of $691,668 from the previous year.

Of the total gold and silver in 1902 the sum of $13,272,084 was derived from quartz mining operations, including mills and smelters; $1,259,026 came from placers, $913,633 from drift mines, $1,280,694 from hydraulic mines, and $801,295 from dredging operations. This shows that a total of $4,254,648 was derived from gravel mining in its different forms. Including the dredging operations, $2,060,321 was from placer mining, that branch of the industry eclipsing both the drift and hydraulic branches separately, and almost equaling their combined output. This seems an odd result when it is considered that placer mining has been generally considered a "played out" industry in California. Its resuscitation, however, is largely due to the dredger system of mining, which has proved quite successful. By this system tracts of land where the gravel lies too deep for ordinary surface work, and where hydraulicking can not be done by reason of lack of fall for tailings, can be worked profitably. Such ground would not pay under the drifting process. It has, therefore, been left to be utilized by the dredgers, though always known to carry considerable gold. Orchard, vineyard, and other farming land has been bought up by the dredging companies and worked for gold. The orchards and vineyards are, of course, destroyed in this process of mining. Oroville, Butte County, is at present the center of this industry, there being 26 dredgers at work there and more building. In the vicinity of Marysville, Yuba County, large tracts of land have recently been purchased for dredging purposes and some very large machines are being built to mine it. In

Sacramento, Calaveras, Shasta, and Trinity counties some dredging is also being done. The dredgers cost on an average about $60,000 each, so that only men of capital or companies can afford to mine for gold on this system.

Included in the amount derived from quartz is the gold and silver obtained in copper-smelting operations, $361,951 gold and $369,671 silver, a total of $731,622. This silver is given in commercial value. The gold and silver derived in this manner came from the counties of Shasta, Calaveras, San Bernardino, Tuolumne, and Fresno, mainly from the first named, where the largest smelters are situated.

There has been for two years past in California considerable development of the copper mining industry in many counties, but more particularly in Shasta. But in Plumas, Mariposa, Fresno, and Calaveras considerable development work is being done, though no new smelters have been erected.

Few changes are to be noted in the general condition of the gold mining industry of the State. There is a tendency, however, apparent to increase the capacity of milling plants where the ore bodies warrant, and many old mills have had their number of stamps doubled.

Most of the new mills ordered are larger than was formerly the custom; that is, instead of 10 stamps, 20 are put up at once when a plant is installed. Two new mills of 120 stamps each have been built since the last report, both of these in Calaveras County, and one in a reopened mine. Several of 60 stamps have also been constructed.

It may be said, also, that confidence inspired by the success of certain large mines in deep mining, particularly in the mother lode counties, is causing deeper shafts to be sunk than was formerly the case.

In most mines of prominence while drifting and stoping is going on, the shaft sinking is kept a continuous part of the work, instead of being intermittent, as formerly. While 500 feet used to be rather a deep shaft, many are being sunk to 1,000 or double that. In Amador, County there are now six shafts over 2,000 feet deep, and one is 2,750 feet below the croppings. This shows the tendency of the more modern development work. These deep shafts naturally require heavy and expensive equipment in the matter of pumping and hoisting machinery, but there appears to be plenty of capital forthcoming for this purpose where the indications or conditions warrant.

Very few of the older quartz mines have been closed down within the past year, while many new ones are being opened and developed.

Old mines, long idle, are also being reopened and equipped. Large investments are being made in promising quartz properties and there is always a demand for these at fair prices.

Small drift mines have also come into favor of late; that is, such mines in localities where no long bed-rock tunnels have to be run to tap the buried channels, as has to be done to get at the gold in the buried river beds under the lava-capped divides of Placer, Plumas, Sierra, and a few other counties. The place where the smaller drift mines are most numerous is the region around Blue Ravine, above Folsom, Sacramento County. The success of the Gray Wing and the Consolidated El Dorado Mining companies in that locality has led to the formation of a number of other mining companies, and for some miles along the ravine and valley shafts are being sunk. It is only about 80 feet to bed rock and the gravel is breasted and drifted out in the same manner as the larger drift mines of the Forest Hill divide and elsewhere, but the ground lies so that tunnels are not possible or necessary.

Water gives little trouble. When a part of the ground is worked out a new shaft is sunk farther ahead and the machinery moved to it. This is a great advantage for cheap mining over such mines as must have long tunnels to reach the auriferous channel. In many of these cases it is 5,000, 10,000, or even 15,000 feet from the mouth of the tunnel to the gravel breast being worked, and long haulage is therefore necessary to bring the gravel outside for washing.

Moreover, in these smaller drift mines, it being such a short distance to bed rock, the ground may be well prospected in advance by means of Keystone drills, so that there is a reasonable certainty, before any shaft has to be sunk or machinery provided, as to the value of the gravel. For these reasons not only is the particular locality mentioned being worked in many places, but prospecting is going on elsewhere upon ground of a similar character. It is worthy of note that extensive placers and hydraulic mines were worked profitably fifty years ago near by where these drift mines are located, but large tracts of the deeper gravels were left untouched until the present day.

There were in 1902, out of the 57 counties of the State, 35 counties which produced gold and 27 from which some silver was derived. The counties which yielded over $1,000,000 in both gold and silver were:

Nevada	$2,148,864
Calaveras	2,119,173
Tuolumne	1,798,409
Amador	1,631,837
Kern	1,265,117
Shasta	1,185,593

The order of counties by rank of production for 1902 for gold and silver is given in the following table:

COUNTIES BY RANK OF PRODUCTION FOR THE TWELVE MONTHS ENDED DECEMBER 31, 1902.

GOLD.

County.	Amount.	County.	Amount.
1. Nevada	$2,142,740	20. Inyo	$74,397
2. Calaveras	2,072,939	21. Humboldt	60,015
3. Tuolumne	1,791,829	22. Fresno	51,427
4. Amador	1,629,151	23. Riverside	47,947
5. Kern	1,165,982	24. Madera	35,128
6. Butte	916,782	25. Lassen	23,410
7. Siskiyou	906,989	26. Tulare	11,648
8. Shasta	878,706	27. Alpine	10,359
9. Placer	843,366	28. Los Angeles	7,209
10. Trinity	719,992	29. Monterey	6,860
11. Mariposa	631,478	30. Del Norte	5,450
12. Mono	510,596	31. San Luis Obispo	2,399
13. Sacramento	425,894	32. Ventura	2,012
14. San Bernardino	394,936	33. Colusa	850
15. Plumas	380,686	34. Orange	250
16. San Diego	338,877	35. Santa Barbara	200
17. El Dorado	335,031		
18. Sierra	326,155	Total	16,910,320
19. Yuba	155,630		

COUNTIES BY RANK OF PRODUCTION FOR THE TWELVE MONTHS ENDED DECEMBER 31, 1902—Continued.

SILVER.

County.	Amount.	County.	Amount.
1. Shasta	$306,887	16. Trinity	$550
2. Kern	99,135	17. Plumas	517
3. San Bernardino	58,972	18. Sacramento	330
4. Calaveras	46,234	19. Sierra	311
5. Mono	36,548	20. Lassen	244
6. Fresno	21,200	21. Siskiyou	233
7. Inyo.	14,484	22. Riverside	94
8. Tuolumne	6,580	23. El Dorado	52
9. Nevada	6,124	24. Monterey	18
10. Mariposa	3,880	25. Ventura	4
11. Alpine	3,770	26. Madera	3
12. Placer	3,341	27. Yuba	2
13. Amador	2,686		
14. Butte	2,219	Total	616,412
15. San Diego	1,994		

Alpine County shows a decrease in product for the year of $12,299. There are very few mines in this county, and it is only within the past two years that any work has been done on mining properties for a long time.

Amador also shows a decrease of nearly $200,000, which is due to the closing of one important property during litigation and a reduced yield from a few others. This county stands fourth in rank in gold and silver production, and gives employment to 1,841 miners. The deepest mines in the State, and some of the most profitable are in Amador. The principal producing mines are the Keystone, at Amador City; Kennedy, Oneida, and Zeila, at Jackson, and Central Eureka and Wildman Mahoney, at Sutter Creek.

Butte County increases its yield over previous year by nearly $50,000, and has 881 miners employed. The principal mines are the Big Butte, at Berdans; Cherokee, at Cherokee; Gold Bank, at Forbestown; Nimshew, at Nimshew, and at Oroville the following dredging companies: American, Boston and Oroville, Butte, Cherokee, Feather River Exploration, Indiana, Kia Oro, Lava Bed, Marigold, Oroville, and Penn. Some of these companies own several dredgers, working at different points near the town.

Calaveras, which is number two in rank in gold product, increases its yield by nearly $50,000, and in 1902 came very near reaching the figures shown in Nevada County. It is one of the two counties producing over two millions a year, and in its mines 1,614 miners find employment. The largest gold-producing mine in the State—the Utica, at Angels—is in this county. The principal producers are the Utica and Lightner, at Angels; Penn (copper), at Campo Seco; Gwin, at Gwinmine; Royal, at Hodson; Melones, at Robinsons, and Sheepranch, at Sheepranch. There are 63 producing mines of importance, aside from numerous small ones.

Colusa shows a small decrease in its output, as does also Del Norte. In the latter nothing but placer mines are worked, some of these on the ocean beach.

El Dorado increases its yield over previous year by $37,070, with 647 miners at work. There are 66 producing mines, aside from small ones, but only one of them produced over $35,000 in 1902.

Fresno has very few mines of consequence, but shows an increased yield of $54,165, which is the result of smelting ores at the Copper King (Limited) furnaces, an institution which has since, with the copper mines at Clovis, been closed down.

Humboldt is a gravel mining county exclusively, but the gold yield of 1902 falls off materially from that of 1901. Most of the mines are at or near Orleans, and no one of them in the county exceeds $20,000 in yield for the year.

The decrease in Inyo for the year amounts to about $130,000, which is largely due to the closing down of a few prominent mines.

Kern County shows an increased yield of $217,561 for the year, owing to the greater productiveness of some of the larger desert mines.

The number of miners employed is 1,050. The principal producers are the Dead Tree, at Amalie; King Solomon, at Havilah; Hooper and Old Keyes, at Isabella; Phœnix and Standard, at Johannesburg; Exposed Treasure and Karma, near Mohave; and Butte, Gold Coin, Napoleon, Phœnix, Sunshine, and Yellow Aster at Randsburg. The last named is the most productive in the county, and one of the largest producing mines in the State.

Lassen County shows a proportionately large increase for the year, which is due to the operations of the Lassen Mining Company, operating the old Golden Eagle mine, at Hayden Hill. There are very few mines in the county making any production.

Los Angeles is unimportant as a gold-yielding county, there being no mine of any productive character. Most of those at Acton have closed down. Madera County also makes a poor showing for the year with a reduced output, some of its more important mines having been unproductive in 1902.

Mariposa County mines yielded $217,561 more in 1902 than in the previous year. Two-thirds of this increase came from the operations of the Mariposa Commercial and Mining Company (the "Grant Company") at Mount Bullion, and the Merced Mining Company at Coulterville. The Mariposa Company is employing 220 men and working four of its mines, with mills, cyanide plant, etc., and is also leasing a number of its other claims. The Merced is a Boston company, now productive. There were 656 miners employed in the county in 1902. The principal mines are those above named, the others operated in the county being comparatively small producers. Mines are being worked at Baxter, Bear Valley, Cathay, Copper, Coulterville, Hornitos, Jerseydale, Kinsley, Lewis, Mariposa, Mount Bullion, and Whitlock. At the latter place the old mine of the Sierra Butte Company is no longer a producer.

Mono County shows an increase of $28,698. This increase is accounted for in the returns of the Standard Consolidated Company and the cyanide plants at Bodie, and those of the Crystal Lake Company, at Lundy. These are the principal properties in the county, though the Cornucopia and Borasca at Benton gives considerable yield of silver.

Moterey is a small gold-producing county and its output shows a falling off for the year. The only gold mines are in Los Burros district.

In proportion to its gross output Nevada County shows a very small increase in gold yield; but it continues to lead all other counties in the State in output of that metal. The total gold for the year 1902 was $2,043,687, and of silver $6,059. There are 1,812 miners employed in the county according to returns received at the United States mint at San Francisco. Some of the mines have largely increased their output, while others have reduced theirs. Some of the largest quartz mines in the State are in this county, at Grass Valley, and the equipment of a few of them is considered model. The principal producers are the Empire Mines, North Star, Bullion, and Pennsylvania, at Grass Valley; Liberty, at Lowell Hill; Crystal Lake, at Meadow Lake; Champion, Federal Loan, Home, Lecompton, Pittsburg, and Red Dog, at Nevada City; North Bloomfield and Badger Hill, and Cherokee, at North Bloomfield; Consolidated St. Gothard, at North Columbia; Eureka and Yuba, at North San Juan; Harker and Penrose, at Relief; Omega and Red Cross, at Washington; and Mountain Maid, at You Bet. In this county both quartz and gravel are extensively worked.

Orange County has a few unimportant placers only, at Capistrano.

Placer County shows a material falling off of nearly $60,000 in yield for the year. This is ascribed to lack of water during the mining season. Placer has over 1,600 men at work in its mines. This county is famous for its extensively developed drift mines. One, the Hidden Treasure, at Centerville, or Michigan Bluff, being the best producing mine of its kind in the State. Mines in the county which produced amounts exceeding $10,000 in 1902, are the Eclipse, Mammoth Bar, and Three Stars, at Auburn; Paragon, at Bath; Philadelphia and Red Point, at Damascus; Indian Bar, at Gold Run; Big Dipper, Gleason, and Morning Star, at Iowa Hill; Basin Consolidated, Boston and South Dakota, and Hidden Treasure, at Michigan Bluff, and Eclipse, at Ophir. There are many Chinese employed in this county, and a number of hydraulic mines are being worked.

Plumas County does not show quite so large a yield as in the previous year. There are very many mines in the county, mainly gravel, but few of them are large producers. Nearly one-third of the output of the county for the year came from one quartz mine alone. There are 1,268 miners employed in the county, about one-fourth of them Chinese.

Only two mines in the county produced over $10,000 in 1902 aside from the big quartz mine, which yielded more than ten times that amount.

Riverside County, from the returns received, shows a decrease in output of $63,856. The mines at Perris and Walters both show reduced returns for the year.

Sacramento County gives the material increase for the year of $196,646, which, next to that of Kern, is the largest increase shown by any county in the State. Of the total of $426,224, the sum of $225,030 came from the shallow drift mines, mainly at Folsom, and $155,194 from the dredgers at Fair Oaks and Folsom. The balance was from placers, most of which are worked by Chinese. A great deal of prospecting is going on at Folsom and within several miles of that town, and a number of new mines are being opened. The drift mines near Folsom, reference to which has previously been made in this chapter, are doing very well.

There is an insignificant decrease in the output of San Bernardino County for the year. At Ludlow extensive development work is going on and more mines are being opened. The Coolgardie placers near Barstow did not do so well as in the previous year. The largest producers in the county are the Waterloo (silver), at Daggett; Brooklyn, at Dale; Gold Mountain, at Doble; Bagdad, at Ludlow; Dean and Jones, at Slate Range; and Gopher, at Victor. The Bagdad Company is the most productive in the county.

San Diego County shows a falling off of $78,453 for the year. This is entirely due to the lessened output of the Free Gold Mining Company (Golden Cross), at Hedges. At Banner and Julian, the amount produced was smaller, but at Ogilby it was larger. The principal mines are the Free Gold, at Hedges; High Peak and Helvetia, at Julian; and American Consolidated, at Ogilby.

The placers at La Panza, in San Luis Obispo County, yielded $2,000 more in 1902 than in the previous year. From Santa Barbara the gold yield of the ocean beach, at Lompoc, was only nominal.

In Shasta County there is an apparent falling off of over half a million dollars from the previous year, which is, however, partly accounted for, as previously stated, by taking the silver product at commercial instead of coining value, and still further accounted for by miners' strikes, closing down important mines and works part of the year. There is nearly $700,000 decrease, considering these points, in the total combined output of the Mountain Copper and Bully Hill Mining companies, and the gold output alone of these companies is reduced by nearly one-half. The labor strikes at the Mountain Copper Company's mines and smelters caused a stoppage of operations for a time, and the other company also closed down. During that period numbers of quartz mines which shipped quartz ores to these smelters were compelled to quit work also, so that the general result is as stated. Other copper smelters are planned in this county, but thus far no new ones have lately been put up. There are 1,504 miners employed in the county. The mines which have produced over $10,000 for 1902 are as follows: American Quartz, Gladstone, Summit, and Sybil, at French Gulch; Dixon and Cooper, at Igo; Mountain Copper Company, at Keswick; Midas, at Knob; Central and Texas Consolidated, at Whitehouse; and the Bully Hill Company, at Winthrop. The largest product of gold from any one mine was at the Midas mine, and the most silver came from the works of the Mountain Copper Company.

Sierra County gives evidence of a decrease in output amounting to $249,716. The largest producer in the county did not yield much over $50,000, and there were only two in addition to this which produced over $20,000 each. Quite a number of mines give returns, but few of them are large operations. This is mainly a gravel mining county, though the producing mines are quartz. Those yielding in 1902 over $10,000 were as as follows: Crœsus and Golden State, at Allegheny; Gold Bluff and White Bear, at Downieville; New York, at Gold Lake; Sierra Buttes and Young America cyanide works, at Sierra City; Eighty-nine, at St. Louis; and Old Doherty, at Table Rock.

The increase for the year in Siskiyou County amounts to $14,771, with 1,689 miners at work. This, too, is a gravel mining county, though many of the large producers are quartz. The hydraulic mines in this county are extensive and are not subject to any restrictions under the law as they do not dump tailings into navigable streams. Therefore the hydraulic mines are operated at will without having to impound any tailings. For this reason hydraulic mining flourishes in this county. There are large tracts upon which water has not yet been brought, for there are no general ditch and reservoir systems, as in some of the central counties of the State, but each mine provides its own water supply. There are two dredges operating in the county, one at Callahan and the other at Yreka. The principal producers in the county are the Helena, at Callahan; Fidelity, King Solomon, and Salmon River, at Cecilville; Nordheimer and Red Hill, at Forks of Salmon; Brokau and Lewis, Cherry Creek, Fernandez, Morrison, and New York and Monarch, at Fort Jones; Consolidated Gold Run, at Gilta; Eastlick, at Greenview; Oregon, at Happy Camp; Minette, at Nolton; Highland and Yreka, at Rollin; Salmon River, at Sawyers Bar; Lee Yack, at Seiad; Commodore, at Walker; and Schroeder and Yreka Creek Dredge, at Yreka. Returns were received from 258 producing mines in this county, aside from the small mines and Chinese. About half the total yield of gold came from quartz mines, notwithstanding the county is best known for its gravel properties.

Trinity County increases its output for the year by $33,191. This, too, is a gravel mining county with similar conditions to those mentioned in Siskiyou County. However, there are several important producing quartz mines and the quartz mining interests of the county are being rapidly advanced. Indeed, the largest gold producers are now the quartz mines, and more gold came from the quartz mines than from the hydraulic properties in 1902, though the totals, of placer, drift, and hydraulic mines exceeded that of quartz alone. The principal mines are the Golden Jubilee and Oro Grande, at Carrville; Enterprise and Lone Jack, at Coleridge; Brown Bear and Lappin, at Deadwood; Globe, Maple Creek, and Trinity, at Dedrick; Union Consolidated (Dorleska), at Dorleska; Indian Creek and Texas Jack, at Douglas City; Compagnie Française and Hurtevant, at Junction City; Fairview, at Minersville; Sykes, at Trinity Center; La Grange, Hydraulic, and Hupp, at Weaversville and Bully Choop, near the borders of Shasta County.

Tulare County has only quartz mines, most of them at White River and one at Plano. A smaller gross yield was made than in the previous year.

Tuolumne, one of the mother-lode counties, famous for its productive quartz mines, increases its yield for the year by $88,254 and stands third in rank of gold yield for 1902. Returns show 1,821 miners employed. Very little surface or other gravel mining is done in this county now, the quartz interests greatly predominating. The most productive mines are the Longfellow, at Big Oak Flat; Goldwin, Hard Tack, Mohecan, Providence, and Prudhomme, at Carters; Eagle Shawmut, at Chinese Camp; Densmore and Mountain Lily, at Columbia; Confidence, at Confidence; Mount Jefferson, at Groveland; Republican, at Jacksonville; Dutch, at Quartz; Golden Gate, Golden West, and Neale, at Sonora; Fleming, Harvard, and Rawhide, at Jamestown; Black Oak, Draper, and Soulsbyville Consolidated, at Soulsbyville; Golden Rule and Jumper, at Stent; and Gillis, at Tuttletown.

The two quartz mines at Griffin, in Ventura County, only produced together about one-half what they did in the previous year.

Yuba County shows a material decrease in output for the year. There is less coming from the quartz mines at Browns Valley and Brownsville and less from the gravel mines. The bulk of the output is from gravel mines. Mining is carried on in this county at Browns

Valley, Brownsville, Bullards Bar, Camptonville, Challenge, Dobbins, Marysville, Rockerby, Smartsville, Strawberry Valley, Waldo, and Woodleaf.

The rate of wages paid to miners in the different counties is practically the same as was given in the last report. It may be said, however, that a number of miners' unions are being formed in several counties, which will doubtless change this at many places. An attempt was made at some of the large mines in Shasta County to enforce an increase of pay, but it was not successful, though the mines and smelters were closed for a time. Similar attempts by newly formed unions are being made in other counties, particularly those in the mother-lode region and in the desert section.

The following table shows the distribution of the total gold and silver product of California, by counties, in the calendar year 1902, based upon returns received from producers at the mint at San Francisco:

PRODUCT OF CALIFORNIA, BY COUNTIES, 1902.

RECAPITULATION.

County.	Gold.	Silver.	Total.
Alpine	$10,359	$3,770	$14,129
Amador	1,629,151	2,686	1,631,837
Butte	916,782	2,219	919,001
Calaveras	2,072,939	46,234	2,119,173
Colusa	850	....	850
Del Norte	5,450	....	5,450
Eldorado	335,031	52	335,083
Fresno	54,427	21,200	75,627
Humboldt	60,015	....	60,015
Inyo	74,397	14,484	88,881
Kern	1,165,982	99,135	1,265,117
Lassen	23,410	244	23,654
Los Angeles	7,209	....	7,209
Madera	35,128	3	35,131
Mariposa	631,478	3,880	635,358
Mono	510,596	36,548	547,144
Monterey	6,860	18	6,878
Nevada	2,142,740	6,124	2,148,864
Orange	250	....	250
Placer	843,366	3,341	846,707
Plumas	380,686	517	381,203
Riverside	47,947	94	48,041
Sacramento	425,894	330	426,224
San Bernardino	394,936	58,972	453,908
San Diego	338,877	1,994	340,871
San Luis Obispo	2,399	....	2,399
Santa Barbara	200	....	200
Shasta	878,706	306,887	1,185,593
Sierra	326,155	311	326,466
Siskiyou	906,989	233	907,222
Trinity	719,992	550	720,542
Tulare	11,648	....	11,648
Tuolumne	1,791,829	6,580	1,798,409
Ventura	2,012	4	2,016
Yuba	155,630	2	155,632
Total	16,910,320	616,412	17,526,732

Source of Gold and Silver Product, 1902.

County.	Quartz.	Placer.	Drift.	Hydraulic.	Dredge.	Total.
Alpine	$14,129					$14,129
Amador	1,579,650	$46,650	$2,217	$3,320		1,631,837
Butte	50,584	104,549	63,464	86,024	$614,380	919,001
Calaveras	2,034,777	33,468	17,929	29,051	3,948	2,119,173
Colusa	850					850
Del Norte		5,450				5,450
Eldorado	263,299	59,856	4,528	7,400		335,083
Fresno	69,521	3,106		3,000		75,627
Humboldt		15,054		44,961		60,015
Inyo	83,333	5,248	300			88,881
Kern	1,262,167	2,950				1,265,117
Lassen	23,654					23,654
Los Angeles	4,399	1,405		1,405		7,209
Madera	35,131					35,131
Mariposa	634,358	1,000				635,358
Mono	537,861	9,283				547,144
Monterey		6,878				6,878
Nevada	1,923,681	65,329	18,761	141,093		2,148,864
Orange		250				250
Placer	153,465	126,002	484,858	82,382		846,707
Plumas	183,486	89,840	6,787	101,090		381,203
Riverside	48,041					48,011
Sacramento		46,000	225,030		155,194	426,224
San Bernardino	442,158	8,250	3,500			453,908
San Diego	337,871	3,000				340,871
San Luis Obispo		2,399				2,399
Santa Barbara		200				200
Shasta	906,283	266,400	175	12,735		1,185,593
Sierra	121,982	56,002	66,891	81,591		326,466
Siskiyou	442,903	156,855	5,809	282,882	18,773	907,222
Trinity	330,785	45,863	8,519	326,375	9,000	720,542
Tulare	11,648					11,648
Tuolumne	1,765,534	200	1,300	31,375		1,798,409
Ventura	2,016					2,016
Yuba	8,518	97,539	3,565	46,010		155,632
Total	13,272,084	1,259,026	913,633	1,280,694	801,295	17,526,732

Comparative Output for 1901 and 1902.

County.	1901.	1902.	Increase.	Decrease.
Alpine	$26,428	$14,129		$12,299
Amador	1,831,271	1,631,837		199,434
Butte	869,612	919,001	$49,389	
Calaveras	2,069,372	2,119,173	49,801	
Colusa	1,800	850		950
Del Norte	10,612	5,450		5,162
Eldorado	298,013	335,083	37,070	
Fresno	21,462	75,627	54,165	
Humboldt	98,615	60,015		38,600
Inyo	218,979	88,881		130,098
Kern	1,047,556	1,265,117	217,561	
Lassen	6,100	23,654	17,554	
Los Angeles	10,312	7,209		3,103
Madera	85,349	35,131		50,218
Mariposa	509,715	635,358	125,643	
Mono	518,446	547,144	28,698	
Monterey	13,800	6,878		6,922
Nevada	2,139,176	2,148,864	9,688	
Orange	4,000	250		3,750
Placer	905,573	846,707		58,866
Plumas	403,792	381,203		22,589
Riverside	111,897	48,041		63,856
Sacramento	229,578	426,224	196,646	
San Bernardino	456,857	453,908		2,949
San Diego	419,324	340,871		78,453
San Luis Obispo	300	2,399	2,099	
Santa Barbara		200	200	
Shasta	1,819,969	1,185,593		634,376
Sierra	576,182	326,466		249,716
Siskiyou	892,451	907,222	14,771	
Stanislaus	15,700			15,700
Trinity	687,351	720,542	33,191	
Tulare	14,716	11,648		3,068
Tuolumne	1,710,155	1,798,409	88,254	
Ventura	4,183	2,016		2,167
Yuba	189,751	155,632		34,122
Total	18,218,400	17,526,732	924,730	1,616,398

CALIFORNIA PRODUCTION RECEIVED AT UNITED STATES MINTS AND ASSAY OFFICES AND ALSO AT PRIVATE REFINERIES AND SMELTERS DURING THE YEAR 1902.

GOLD.

Institution and company.	Standard ounces.	Institution and company.	Standard ounces.
Mint at—		American Smelting and Refining Co.—Continued.	
San Francisco	215,843.431	Globe	
Philadelphia	304.782	El Paso	48.388
Carson	1,810.268	Selby Smelting Co., San Francisco.	682,333.333
Assay office at—		Mountain Copper Co., California	8,564.444
New York	8,147.574	Bully Hill Copper Co., California	5,012.655
Seattle	18.285	Copper King Co. (Limited), California	2,222.222
Denver	83.501	Total	[a]924,394.932
American Smelting and Refining Co.:			
Pueblo			
Philadelphia	6.049		

SILVER.

Institution and company.	Standard ounces.	Institution and company.	Standard ounces.
Mint at—		American Smelting and Refining Co.—Continued.	
San Francisco	39,598.21	Globe	197.67
Philadelphia	85.92	El Paso	5,164.57
Carson	939.02	Selby Smelting Co., San Francisco.	411,111.11
Assay office at—		Mountain Copper Co., California	410,767.77
New York	827.89	Bully Hill Copper Co., California	250,286.12
Seattle	1.01	Copper King Co. (Limited), California	44,444.44
Denver	44.67	Total	[b]163,842.85
American Smelting and Refining Co.:			
Pueblo	371.74		
Philadelphia	2.71		

[a] Value, $17,197,962.90.

[b] Coining value, $1,354,247.54; commercial value (figured at $0.5216 per ounce, fine), $546,354.38.

The following table shows the product of gold and silver as derived from quartz, placers, copper, and lead ores. The placers include surface, hydraulic, drift, and dredgers. In a table previously given in this chapter the gold and silver obtained in working copper and lead ores are included in the quartz:

Source.	Gold.	Silver.	Total.
Copper	$361,951	$369,671	$731,622
Lead	5,506	28,777	34,283
Placer	4,247,602	7,046	4,254,648
Quartz	12,295,261	210,918	12,506,179
Total	16,910,320	616,412	17,526,732

The appended table shows, by counties, the number of men employed in gold and silver mines in California during 1902, and also those at work in copper mines, or lead mines, which produced gold and silver.

The table is made from returns to the United States mint at San Francisco, by producers, postmasters, gold-dust buyers, and others in the different camps. This covers those regularly employed in mining or working for themselves, but does not include prospectors not directly employed in working mines:

MINERS EMPLOYED IN CALIFORNIA, 1902.

County.	Number of men.
Alpine	22
Amador	1,841
Butte	881
Calaveras	1,614
Colusa	3
Del Norte	19
El Dorado	647
Fresno	218
Humboldt	127
Inyo	279
Kern	1,050
Lassen	103
Los Angeles	29
Madera	134
Mariposa	656
Monterey	25
Mendocino	9
Mono	412
Nevada	1,812
Orange	11
Placer	1,640
Plumas	1,268
Riverside	149
Sacramento	474
San Bernardino	816
San Diego	564
Santa Barbara	5
San Luis Obispo	12
Shasta	1,540
Sierra	1,004
Siskiyou	1,689
Stanislaus	8
Trinity	915
Tulare	13
Tuolumne	1,821
Ventura	30
Yuba	295
Total	22,135

The entire mineral product of California for 1902, including all mineral substances and their value, is shown in the following table, from Bulletin No 28, of the California State mining bureau:

TOTAL MINERAL PRODUCT OF CALIFORNIA FOR 1902.

Description.	Quantity.	Value.
Asphalt tons	34,511	$349,344
Bituminous rock do	33,490	43,411
Borax and boric acid do	17,202	2,234,994
Cement barrels	171,000	423,600
Chrome tons	315	4,725
Chrysoprase pounds	50	500
Clays:		
For pottery tons	67,933	74,163
For brick M	169,851	1,306,215
Coal tons	88,460	248,622
Copper pounds	27,860,162	3,239,975
Fuller's earth tons	987	19,246
Glass sand do	4,500	12,225
Gold		16,910,320
Granite cubic feet	257,650	255,239
Graphite tons	42	1,680
Gypsum do	10,200	53,500
Infusorial earth do	422	2,532
Lead pounds	349,440	12,230
Lithia mica tons	822	31,880
Lime barrels	448,664	369,616
Limestone tons	71,422	90,524
Macadam do	500,939	418,548
Manganese do	870	7,140
Magnesite do	2,830	20,655
Marble cubic feet	19,305	37,616
Mica tons	50	2,500
Mineral paint do	589	1,533
Mineral water gallons	1,701,142	612,477
Natural gas M cubic feet	120,968	99,443
Paving blocks M	3,502	112,437
Petroleum barrels	14,356,910	4,692,189
Platinum ounces	39	468
Pyrites tons	17,525	60,306
Quicksilver flasks	29,552	1,276,524
Rubble tons	1,555,076	830,981
Salt do	115,208	205,876
Sandstone cubic feet	212,123	142,506
Serpentine do	512	5,065
Silver		[a]615,412
Soda tons	7,000	50,000
Slate squares	4,000	30,000
Soapstone tons	14	288
Tourmaline		150,000
Turquoise pounds	510	11,600
Total		35,068,105

[a] Commercial value.

COLORADO.

By Frank M. Downer,

Assayer in charge, United States mint, Denver, Colo.

The value of Colorado's production for 1902 is as follows:

Gold (at $20.67 per fine ounce)	$28,516,588
Silver (coining value, at $1.29 per ounce)	20,429,522
Lead (at $0.0407 per pound)	4,323,936
Copper (at $0.1188 per pound)	1,005,517
Zinc (at $0.0484 per pound)	2,537,942
Total	56,813,505

Compared with the preceding year (when the average price of lead was $0.04334 and copper $0.16555, with no report as to zinc production), in 1902 the total values changed as follows: Gold, increase, $760,275; silver, decrease, $3,563,455; lead, decrease, $2,095,194; copper, decrease, $466,406.

The general review for the past year shows that in several sections of the State a depressed condition has prevailed in mining interests, especially in those districts where lead, copper, and silver have been the principal metals mined, as these commodities have felt the influence of low prices all through the year. Notably this has been true in regard to the districts surrounding Aspen, in Pitkin County; Creede, in Mineral County; some portions of Red Mountain, lying in the San Juan County, and in the silver sections of Hinsdale, Gunnison, and Saguache counties.

NEW LEADVILLE EXTENSIONS.

No new mineral districts of importance have come to the front during the year, except in the old camp of Leadville, where widening of the mineralized territory by new discoveries on Progressive Hill, which is generally conceded to be a continuation of the ore chutes of Fryer Hill, have given an unknown length of life to the Leadville carbonate deposits.

When it is remembered that from less than 100 acres of ground on Fryer Hill more than $55,000,000 was extracted, the discovery of the same ore chutes, with pristine values, and a practically unknown extent of territory, but probably several times as large as Fryer Hill, it is not remarkable that the mining interests of Leadville feel that a new era is opening for them.

LOWER GRADES BUT LARGER TONNAGE.

While it may be stated that the general values of the ores mined throughout the State are lower than formerly, yet so much more careful management in the general conduct of mining as a business has been introduced, and so many improvements in machinery, with so much larger machinery, and hence, more economical working, that as the grades lower the profits have in reality increased, for the tonnage has in almost every instance been greater.

ZINC PRODUCTION IMPORTANT.

A most interesting feature, which means a great deal to the future of Colorado's mining industry, is the prominence which zinc mining seems to be assuming in the State. A very few years ago one obscure property at Creede succeeded in separating its lead and zinc blende.

This was the beginning of what has grown to be a most important industry, and Leadville, with its practically inexhaustible zinc deposits, easily leads the counties of the State in its output of this ore. A very large tonnage of this character of ore is annually shipped from Leadville to the Gulf of Mexico, and thence to Belgium for treatment.

But a very few years ago no market could be found for Colorado zinc in the East in competition with the zinc ores of the Middle West. To-day its ores are acceptable in any quantity, with all of the zinc smelters of the East competing for them.

EXCELLENT SMELTING PLANTS.

From a metallurgical standpoint the great smelters of the State have maintained their past record of excellence in work, and the smelting of ores as practiced in this State is regarded the standard of excellence and economy.

CHLORINATION AND CYANIDE ADVANCES.

In chlorination of gold ores and in cyanide treatment some important advances have been made during the year. In chlorination it is confidently expected that before the next year has passed the great works of the Standard and Colorado mills, of the United States Reduction and Refining Company, will have their plants handling gold ores from chlorine generated by electricity and, in general, the whole system of extraction will probably be changed.

In the cyaniding of gold ores a most important step has been practically demonstrated at the Smuggler-Union mill at Pandora, in which a very greatly increased activity can be secured in the solvent power of the cyanide, a greatly decreased consumption of cyanide obtained, and a practically regenerated standard solution produced from the foul solutions at a minimum expense.

APPROVED CONCENTRATION SEPARATOR.

In the mechanical preparation and separation of ores in concentration, as in the Blake Zinc, Iron, and Lead Separator, which is simplicity itself so far as the working parts of the machine are concerned, and which depends upon the electrical conductivity of the particles of mineral for its separation, using static electricity to accomplish this purpose, another long step has been achieved in both economy and effective work.

In almost every department of applied science to the subject of mining in its broadest sense, advancement of a most practical character has been the record of the year just passed, and it is in just these lines of work that each year adds its quota of improvement and makes it possible to mine or smelt a little lower grade of ore than the year previous.

TELLER COUNTY (CRIPPLE CREEK DISTRICT).

During the year just closed, no extension of the productive area of the Cripple Creek district has been recorded nor has the increased depth attained demonstrated that ore bodies carry increased values.

In fact, the reverse is the case, and the ore bodies are showing much heavier sulphur contents and lower gold values. The increased tonnage is largely due to treatment of the dumps of many former bonanza producers; ores being profitably treated at the local cyanide mills which carry as low as $6 in gold to the ton. It is possible that owing to the weathering process the gold-bearing minerals in the ore which has been on the dumps for years had become oxidized to such an extent that they are more amenable to the cyanide treatment.

The entire northern end of the ore-bearing zone is made up of vast bodies of low grade, a very large part of which will fully reach, if not exceed, in value the grade mentioned above.

Another fact connected with these ore bodies is, especially those on Ironclad Hill and parts of Globe and Carbonate hills, that, as far as the hills have been prospected, the ore is in an oxidized condition and should be easily treated.

CYANIDING THE DUMPS.

As an illustration of this truth, during the early part of the year Mr. A. H. Heller, after testing the dumps on the Ironclad mine, purchased the dump and erected an experimental plant of a few tanks, which he did not even put under cover. The ore was coarsely screened and subjected to cyanide treatment. It averaged $5 per ton in value and an extraction of 85 per cent of the gold contents was made. The cost of treatment and procuring the ore amounted to $2 per ton.

LEASING LARGELY ABOLISHED.

The leasing system did much in the early days to open up ore bodies and new territory, but as mines were developed, and as large areas passed to syndicates, these companies gradually stopped leasing their ground.

DISTRICT PAY ROLL.

The pay roll for the district, not including salaries of managers, superintendents, clerks, and employees of the various mercantile establishments, is as follows:

Number of men employed in mining and kindred occupations	6,270
Average daily wages	$3.44
Total pay roll per month during 1902	$652,189.41
Total tonnage produced	647,327

REDUCED DIVIDENDS.

During the year dividends from the stock companies were very much reduced. Several large producers have reached the heavy water flow of the district and until a drainage tunnel is driven and the water level lowered certain mines can not hope to continue paying dividends. This tunnel is an assured fact, however.

Moreover, many mines have devoted their efforts to blocking out ground, only taking out sufficient ore to meet expenses and pay small dividends. Among these properties were the following: Last Dollar and Ajax.

Portland had two-thirds of its force on development during the year, and put a large part of its regular dividends into the new Portland mill at Colorado City.

The Mary McKinney only broke sufficient ore to pay expenses and the regular dividend.

The Blue Bird, Empire State, and others were simply under development.

It may be safely stated that the ore bodies of the district were never blocked out so thoroughly and systematically as now. The depths attained by some of the shafts, as taken from a report by Mr. Charles J. Moore, mining engineer, follows: Portland shaft No. 1, 1,100 feet; No. 2, 1,260; Granite, 1,000; Ajax, 1,000; Stratton's Independence, 1,460; Strong, 900; Gold Coin, 1,100; Modoc, 800; Last Dollar, 1,218; Blue Bird, 1,371; Logan, 1,400; Wild Horse, 1,050; Isabella, 900; Independence T. & M. Co., 1,160; Vindicator, 1,200; Lillie, 1,510; Golden Cycle, 900.

SECONDARY GOLD DEPOSITS.

In several of the deeper shafts, notably the Last Dollar and Blue Bird, the ore is considerably richer than in the zones above. The theory has been advanced that this enrichment is due to secondary deposit, meaning that the gold values of the poorer zones above have been leached and redeposited at the greater depths. An interesting feature of these richer ore bodies at depth (the exception in this district) is the presence of copper, which is entirely absent from the oxidized portions of the veins above the 1,200-foot level, and in some cases galena has appeared, which has been heretofore quite a rarity in the district.

The opinion of many engineers in regard to the theory of secondary enrichment is that the facts so far brought to light do not warrant it. They argue that the secondary formation would show an altered mineral made up from the leached minerals of the zone above, whereas the minerals forming the new zone are essentially of a primary formation.

NEW MECHANICAL DEVICE.

Among the interesting mechanical devices brought into use during the past year in the district is the Crane Automatic Ore Dresser and Picking Table. The ore direct from the mine is let into a revolving screen by means of a chute, the screenings falling into a bin, whence they are conveyed to any desired locality. From this screen the coarse ore falls into a drum, through which runs a screw conveyer which takes the rock through a water bath, thoroughly cleaning it, and allowing the sediment, which is very rich in gold values as a rule, to fall into a tank provided with a convenient man-hole for cleaning.

The washed ore is discharged upon a picking belt, which travels 18 feet in one minute, giving ample time for the ore sorters to pick out the valuable ore, which can readily be detected as the ore is all washed from adhering dirt. The revolving screw makes 12 revolutions a minute, handling at a minimum 250 tons a day. The economy in the use of water is a distinctive feature.

ECONOMIC MILL.

The Economic mill is located at the portal of the United Mines Transportation Company's tunnel on the west slope of Squaw Mountain. This tunnel, which is destined to ultimately connect all the properties of the Woods Investment Company, has already cut the Gold Coin workings and is equipped with an electric trolley system whereby the milling ore is brought out by the train load directly to the ore bins of the mill. This mill is a chlorination plant with a capacity of 300 tons a day. All departments of the mill are run by individual motors.

NEW FILTERING METHOD.

The most interesting feature introduced during the year is a method of filtering out the gold chloride solutions in the barrels, which has replaced the double lead sheets formerly used as filters, and has increased the capacity of the barrels from 15 to 20 tons of ore to the charge on account of extra space afforded. On a line opposite the water intake of the barrel a series of elliptical lead plates, 12 by 7 inches in their greatest diameters, is arranged in groups of three. They are concaved and have perforations about one-sixteenth of an inch in diameter. Directly under these plates an outlet pipe joins a large lead pipe running the length of the barrel on the outside, having one end closed and the other connected with a short length of chemical rubber hose which is closed by a strong clamp. When filtering takes place this clamp is loosened and the solution allowed to run out. The mill superintendent states that the work of filtering by this method is most satisfactory and that the filters will last very much longer than by the old method and are much easier replaced, besides giving the extra capacity of 5 tons to each barrel.

THE PORTLAND.

At the Portland an improvement in the handling of the ore mined is in progress. Instead of using the ordinary ore car it is the intention to substitute large iron skips holding 5 tons at a load, which will fit in the guides of the shaft the same as the cage. These are provided with a truck which will run on the track at the different levels and are pushed under any particular chute from a working stope. The gate is opened and the skip filled, taken to the shaft, and hoisted to surface. A much larger quantity of ore can be handled at much less expense by this method.

MILLS AT COLORADO CITY.

The Standard and Colorado mills of the United States Reduction and Refining Company, at Colorado City, have been steadily employed. The work at these mills is by the chlorination method, nearly all the ore coming from the Cripple Creek district. They handled during the year over 700,000 tons.

The Portland mill, owned by the Portland Mining Company, of Cripple Creek, was completed during the early autumn and is also a chlorination plant. It has a daily capacity of 300 tons, and is also located quite near Colorado City.

Another mill completed during the latter part of the year, at Colorado City, is the Telluride, which uses bromine instead of chlorine as the active solvent for the gold in the ores treated. As the work was not perfected in every detail, the management has not felt disposed to make the methods used public, but their claims are that they are successful in securing an almost complete regeneration of the bromine solution after use, and in saving an exceptionally high percentage of the gold values.

LAKE COUNTY (LEADVILLE DISTRICT).

The Leadville district has shown itself to be the famous producer of past years, especially in regard to the tonnage raised to surface during the year 1902. One hardly knows what new phase of development to expect from this wonderful region. If the price of silver falls to a point where it seems that the mines will have to close, an overruling power seems to provide gold in its place. When the lead reserves begin to show signs of exhaustion, the almost inexhaustible deposits of zinc are found to be remunerative.

EIGHT METALS MINED.

Very few persons outside of the Leadville district are aware of the fact that in these wonderful mines which surround and underlie the town of Leadville eight different metals are mined and shipped as individual products, all of which are associated to a greater or less extent with and include the precious metals. These are as follows: Gold, silver, lead, iron, zinc, copper, manganese, and bismuth.

METAL PRODUCTION FOR 1902.

The metal production of Leadville for 1902 is shown in the following table taken from local sources, the figures varying somewhat from statistics furnished the Mint by refineries throughout the country:

Product.		Quantity.	Market value.	Total value.
Gold	ounces	63,023.26	$20.67	$1,302,680.78
Silver	do	4,853,613.11	.52⅛	3,051,195.83
Lead	pounds	41,637,892.00	.0407	1,694,410.22
Copper	do	2,643,507.00	.11⅔	308,409.16
Spelter	do	71,098,700.00	.0485	3,103,448.26
Manganese	do	2,100,000.00	.004	8,400.00

TONNAGE SHIPMENTS.

The total tonnage of the ore as shipped to the various smelters is as follows:

Class of ore.	Tons.
Lead carbonates	22,930
Oxidized iron	285,494
Iron sulphides	281,558
Zinc sulphides	85,699
Silicious ores	72,215
Manganese oxides	1,050
Total tons shipped	748,946

LABOR EMPLOYED.

To extract and handle this ore the labor employed in the Leadville district is as follows:

Miners	2,278
Smelter men	1,000
Teaming	187
Miscellaneous	1,021
Total	4,486

THE YEAR'S PROGRESS.

During 1902 the progress in the Leadville district may be summed up as follows: The remarkable strike in the Progressive Mining Company's property on Progressive Hill on the north side of Evans's Gulch, opposite Fryer Hill; the strike in the Reno shaft in Iowa Gulch, in the Corona shaft on Iron Hill, in the Valley shaft on Little Ellen Hill, in the Forest City shaft on Little Ellen Hill, in the Morocco shaft in the Leadville Basin, in the Evelyn shaft on Carbonate, and in the President shaft on Breece Hill. The productive area of the district has been very much extended.

YAK TUNNEL EXTENSION.

The district has made material progress in the extension of the great Yak tunnel into the territory of the Ibex Mining Company which will drain the greater part of Breece Hill; the purchase of the old Boston Gold-Copper Smelting Plant by a strong eastern syndicate, and the remodeling of the same, to be put into commission some time during the coming year; the unwatering of Fryer Hill by the Fryer Hill Mines Company, the extensive improvements made in the Arkansas Valley Smelting Plant, and the erection of three large mills for treating the low-grade ores of the district, two for handling the zinc product and one for treating the silicious ores of Breece Hill. The latter is planned to handle the ore by the cyanide treatment.

FRYER HILL ORE CHUTE.

The opening up of the extension of the Fryer Hill ore chute on Progressive Hill is undoubtedly the most important discovery of the past year for the immediate future of Leadville. For nearly twelve years Mr. W. L. Cooper, who had mined in the early days on Fryer Hill when that section was in bonanza ore, has been trying to interest capitalists to provide the means to open up ground on the north side of Big Evans Gulch. He was not successful in convincing capitalists of the probability of finding the ore chute on that side until recently.

After sinking through the wash, which is 30 feet deep at that point, Mr. Cooper sank a drill hole and encountered the identical formation of the ground over the old bonanza mines of Fryer Hill. A shaft of 280 feet was sunk, cutting the black flint. Crosscutting from this point a distance of 37 feet the remarkable body of rich carbonate ore was encountered about the 1st of November. The ore is remarkable for the amount of silver chloride and lead carbonate contained, as samples frequently run as high as 1,000 ounces in silver to the ton, and the average of the lead contents is 50 per cent. In every sample taken thus far gold is found. This has varied from five-hundredths to three-tenths of an ounce to the ton. This section is the present scene of unusual activity, and shafts have been started on all the available ground in the vicinity. Just what the extent of territory is which has been added to Leadville's available productive ground is impossible to state, but the general opinion of mining men is that it is several times as great as was developed on Fryer Hill.

FRYER HILL EXCITEMENT.

The Fryer Hill Mines Company, in the early part of the year, organized for the purpose of securing control by lease of the former great properties on this hill. Ever since 1896 this section had been idle, except for the work of a few scattered lessees. The eastern portion of the hill, generally known as the Lee basin, was under water. All the surface plants were dismantled. The close of 1902 finds the eastern portion of the hill blazing with activity, some eight shafts in operation and over 200. men employed, with an output of at least 100 tons per day from the old workings of supposed exhausted mines.

EARLY-DAY FIGURES.

To appreciate the conditions existing, it should be stated that in the 150 acres controlled by this company over $17,000,000 had already been produced during the early day of Fryer Hill's history. The ore extracted was so rich that nothing under $50 to the ton was considered ore, and as soon as water interfered the work was abandoned. This was all on the first contact or blue lime. It was expected that at least a year would be required to unwater this ground, and on May 1 a force of men was put to work at the El Paso shaft, which is the natural drainage point for the entire section. By June 1 the pumps were started, and by October 1 the workings were sufficiently unwatered to enable underground operations to be started on a considerable scale. While the pumping operations were under way attention was given to other shafts, such as the Jamie Lee, Tip Top, Silver, and Dunken, on all of which new plants were installed, so that by November 1 mining operations were well started in all of this ground.

A large deposit of ore was found in the direction of the iron fault and a breast of 10 feet of excellent grade was opened up. The flint formation, which underlies the carbonate contact and which is from 40 to 60 feet in thickness, has a value of from 10 ounces to 14 ounces in silver to the ton and extends for a distance of 1,800 feet under this property. It is the intention of the company to erect in the near future a pyritic smelting furnace of large capacity to treat this siliceous ore in connection with their sulphides, as the lime formation can be profitably used in connection with these ores as a fluxing material, as the limestone itself carries on an average 3 or 4 ounces of silver to the ton.

VALLEY COMPANY.

The Valley Leasing and Mining Company controls a group of claims on Little Ellen Hill immediately adjoining the New Monarch group. During the year the shaft has been sunk from surface, and at a depth of 280 feet encountered a body of ore 4 feet in thickness and of most excellent grade. At 300 feet another body of ore was cut, 8 feet in thickness, iron being associated with the lead. Gold values are found in both ore bodies. Further sinking will undoubtedly disclose other bodies of ore.

DOWN-TOWN MINING.

During the year a consolidation was brought about between the Morocco and Home Extension companies, and a lease obtained from the city on the streets and alleys in the vicinity of lower Harrison avenue.

Iron ore has been opened up on the west side of Harrison avenue, and it is believed that it is an extension of the Bon Air chute.

THE PRESIDENT STRIKE.

One of the best strikes during the year was made on the President mine, on Breece Hill. This property has been worked by several sets of leasers, but in the early part of the year the owners decided to work it themselves. In drifting to the east a large body of siliceous ore was encountered which averaged considerably over an ounce of gold to the ton. A great deal of lower grade was shipped at a profit.

YAK TUNNEL REVELATIONS.

The work of the Yak Tunnel has been exceptionally satisfactory, both in tonnage and development, and has reached a point of especial interest, geologically considered. The projection of this tunnel into Breece Hill has demonstrated that the vast overflow of porphyry which forms the elevation known as Breece Hill lies on a sedimentary formation. None of the shafts which have been sunk on this hill have been driven deep enough to enter this formation. The tunnel, however, on entering the Ibex territory, at a depth of 1,300 feet, has cut the sedimentary, including some lime, but principally quartzite.

The discovery has an important bearing on the future development of the district, for it opens an entirely new field for investigation.

Mining on Breece Hill has been largely a matter of guesswork. The ore chutes had a certain general direction, but were surrounded by masses of porphyry and with definite contacts missing. Exploration had to be carried on under considerable difficulty. While this condition is not made clearer by the discovery of a lower sedimentary formation, because the upper bodies are not known to be related to the new quartzite bodies, yet the discoveries will give a great impetus to exploration, using the Yak Tunnel as a base of operations.

TO DRAIN BREECE HILL.

During the year a contract was entered into between the Ibex Company and the Yak by which the tunnel is to be driven to the No. 4 shaft of the Ibex, which will strike beneath the Ibex shaft at a depth of 200 feet. This work within the Ibex lines is done by the latter company and will drain the Breece Hill territory. The total length of the tunnel is 10,500 feet, and including the main laterals it is 12,000 feet.

LATERAL CONNECTIONS.

One lateral driven during the year makes connection with the Ruble property, this being run a distance of 1,000 feet. There is also a new lateral connecting the North Mike. Several new winzes have been sunk for the purpose of developing ore, and mineral has been found as far east as Yellow Jacket line. Heavy development work has also been carried on in the Ruby and Bazoo, the Mike and Bulldozer.

One upraise in the Ruby and Bazoo is equipped with a hoist. A large compressor has been added to the tunnel plant, so that 16 air drills can be operated.

A number of leasers have worked through the tunnel during the past year, and shipped largely.

ARKANSAS VALLEY SMELTING PLANT.

The Arkansas Valley Smelting Plant, which is the works of the American Smelting and Refining Company, at Leadville, has made several very costly improvements. One is the enlargement of the power house.

An additional 150 feet has been built on the engine room, and two new large compound condensing engines have been installed. The plant is capable of generating 1,800 horsepower. Two new blowers have been added, making four of No. 8 and three of No. 7, of the Connersville type. The substitution of electric motors for small steam engines has been another means of economy. All pumps have been brought together in one central pump house, a brick and steel building, absolutely fireproof. Two of the smelting furnaces have been increased in size from 75 tons to 125 tons each, giving 10 large blast furnaces having a daily capacity of 1,200 tons of ore.

ROASTING CAPACITY.

Six new hand roasting furnaces were added, making 24, in addition to the Ropp and Horseshore mechanical furnaces already in use.

The total daily roasting capacity is now 375 tons.

An important piece of construction is the new mill for crushing and sampling the sulphide ores before sending them to the roasting furnaces. Two automatic sampling devices have been installed.

During the year two reductions in treatment charges were made, one of 50 cents on the lowest grade of iron ores and the other on low-grade siliceous ores, which has already operated to move a considerable amount of this material.

ZINC ORE INCREASES.

The increase in the output of zinc ore during the year is quite remarkable and is simply the beginning of the possible output of this class of ore from the vast deposits which underlie nearly all of Carbonate Hill and portions of Breece Hill. Under the present rates paid for this class of ore by the zinc smelters, it is possible for a number of the mines to hand sort their ore roughly and make a shipping product which leaves a profit. The prevailing price paid during the year was $9 a ton on the cars for 45 per cent of metallic zinc in the ore, with a dollar off for each per cent less or a dollar more for each per cent above that grade.

During the year the Moyer property shipped 44,691 tons, all hand sorted. The Small Hopes consolidation shipped 7,374 tons; the Yak Tunnel, from leasers, about 7,000 tons, both of which were also hand sorted.

The Adams, Maid, and Wolftone combination, known as the A. M. W., shipped from their mill as concentrates, 20,000 tons, and the A. Y. and Minnie, from their new mill, 6,000 tons, the latter mill having been in operation only during the last months of the year.

NEW ZINC CONCENTRATORS.

During the year two new zinc concentrators were erected, the Minnie mill and the mill at the Resurrection mine, on Little Ellen Hill.

The A. M. W. mill has run constantly and is very conveniently arranged. The ore is first fed into a crusher of the Blake pattern and conveyed to three 5-foot Huntington mills and crushed to pass a 30-mesh screen. This product is fed at once into hydraulic sizers of the cone-shaped pattern, which makes two sizes, fed to six Wilfley tables. The overflow is conveyed to a series of conical settling tanks supplying six other Wilfley tables, and a separation is made giving one product of iron and lead mixed and a second product of zinc, carrying from 10 per cent to 12 per cent of iron. The ore treated in this mill as it comes from the mine only averages about 10 per cent of silica. The capacity of the mill is 100 tons per diem and the output of zinc concentrates for the year was 20,000 tons.

The Minnie mill is built on the same lines and is of the same capacity.

The Resurrection mill will use Huntington mills for crushing and then concentrate on Wilfley tables. The concentrates will be dried over a magnetic separator to clean out a large percentage of iron so as to raise the grade of the zinc.

LEADVILLE'S FIRST CYANIDE MILL.

Another new departure for Leadville is the erection of a mill at the Ballard mine for treating the silicious gold ores found in that section of Breece Hill by cyanide. This is the first cyanide mill erected in the Leadville gold belt, and experimental tests have been very satisfactory.

The outlying districts have not added very materially to the output of Lake County. In the St. Kevin district the Amity mine was the largest producer, averaging about 25 tons a week. In the Twin Lakes district the work has been principally development.

SAN MIGUEL COUNTY.

The output of 1902 in San Miguel County has been confined to a comparatively few mines, the Smuggler-Union, Liberty Bell, and Tom Boy being by far the largest producers. In addition to these, the Ophir Consolidated Mines Company, the Ella Gold Mining Company, the San Miguel Consolidated Gold Mining Company, the Alta Mines Company, and San Bernardo have all been running intermittently.

SMUGGLER-UNION.

The Smuggler-Union Company had an active year in spite of the closing down of all their works during the latter part of 1902, owing to labor troubles, and the assassination of the general manager, Mr. Arthur Collins. During the year the work on this property consisted of fathoms stoped, 9,231.65; distance drifted, 2,385.25 feet; distance upraised 391.75 feet; ore mined and sent to mill, 105,240.81 tons. This does not include old levels cleaned out and retimbered in the upper workings. The old tunnel level, at present the main outlet of the property, gives a depth of 700 feet from surface and the new tunnel will give 200 feet more in depth when it crosscuts the vein.

The Contention mine, one of the properties owned by the Smuggler, and situated in Bear Gulch, is connected with the mills of the company by a long aerial tramway. This, in connection with the other trams belonging to the company, all of which enter the mill from the different upper terminals, gives a total length of aerial tram, of over 5½ miles.

SMUGGLER MILLS AT PANDORA.

The large company mill at Pandora is worked in conjunction with their smaller mill. At the upper terminals of the different tramways the ore is crushed to pass a 2½-inch ring and carried direct to the storage bins at the mills, where it is fed automatically to the stamps. These weigh 1,050 pounds each and drop 100 times a minute, discharging through a 20-mesh screen of 24 wire gauge. The ore then passes over copper plates to amalgamate any gold contained, and the tailings, after being carefully sized and recrushed, are sent over Wilfley and Triumph tables. The tailings from these tables are then conveyed to the cyanide plant and slimes and sand are distributed in the large percolation tanks. These are wooden tanks 40 feet in diameter and 8 feet high, capable of holding 450 tons of material each, which is the average charge.

The overflow of slimes, when filling these tanks, is conveyed in launders to the canvas-table plant, which is very extensive, each table being 12 feet square. The concentrates from the canvas tables are sized again and treated on Frue Vanners, the concentrates from these concentrated slimes reaching as high as $70 a ton. All the concentrates from the mills are shipped direct to the Durango smelter, and the retorted amalgam and zinc precipitates, after refining, are melted into bars and the former sent to the United States mint at Denver, while the latter are shipped to the plant at Omaha.

IMPORTANT CYANIDE EXPERIMENTS.

During the past year a very extensive series of experiments have been carried on in the laboratory of the cyanide plant by Mr. W. H. Davis, the chemist in charge, and the results seem likely to affect, to a very large extent the future of the cyanide industry. This discovery of Mr. Davis, and on which at the present time patents are pending, consists of an exceedingly simple arrangement for regenerating the foul solutions of cyanide. In an experiment on a solution of sodium acetate, in which an alternating current of electricity was passed, Mr. Davis found that a dissociation of chemically combined compounds was effected, and tried the same experiment on the sump solution of cyanide with even better results.

After a number of tests Mr. Davis evolved the following formula, which he believes expresses the equation:

Let R=any nomad alkaline metal.

Let R'=any alkaline metal or group of alkaline metals.

Let M=any base metal.

Let X=in the number of combining bonds of R'.

Let Y=in the number of combining bonds of M; then $R'xMy(CN)x+y+(X+Y)ROH=(X+Y)RCN+M(OH)y+R'(OH)x$. $K2ZnCy4+4NaOH=4NaCy+Zn(OH)2+K2(OH)2(2KOH)$.

About the middle of May, 1902, the large storage tank of the mill was fitted up with two electrodes of lead, the height of the solution and 6 inches wide, one on each side of the tank and 40 feet apart.

The action taking place is electrolytic, as there is no contact and the foul solutions going into the tank have the various metals contained precipitated out as oxides and hydroxides; for while the current which is generated passes through the solution, these impurities are dissociated and do not again combine with the solution. After a run of six months the solution was drawn off and the tank cleaned out, something over 75 tons of precipitate having been thrown down in the tank. This was subjected to analysis, with the following result:

	Per cent.		Per cent.
CaO	60	As	5
$F_2(OH)_3$	4	Sb	5
A1203	4	Co_2	18
ZnO	2	Cuo	Trace.

INCREASED ACTIVITY AND SOLVENT POWER.

Mr. Davis claims that the solution after treatment with the alternating current is very much more active than under normal conditions, having a much higher solvent power, owing probably to nascent cyanogen being formed and held in solution. As evidence of the better work done under the new system, the following report taken from the records of the cyanide plant and indorsed by Mr. Buckley Wells, the general manager of the company, is added. It will be seen from the analysis given above that the ores treated at this plant are complex in character, and under normal conditions would show a considerable consumption of cyanide. Tailings carrying as low a value as $1.80 a ton have been treated at a profit, the average cost of treatment, including all expenses, being 50 cents a ton.

RESULTS OF REGENERATIVE TESTS.

The following data on the regenerative process as applied at the Smuggler-Union cyanide plant is from tests made by W. H. Davis, the chemist in charge of this company's works, and are taken from the records of the cyanide plant:

Month (1902).	Tons treated.	Total KCY used per month.	Strength of solution.	Average value of charge.		Average value of discharge.		Net sales.
		Pounds.	*Per cent.*	*Gold.*	*Silver.*	*Gold.*	*Silver.*	
January	9,455	15,600	6	0.087	1.89	0.037	1.33	$4,393.53
February	10,471	14,400	8	.077	2.25	.025	1.45	11,518.72
March	8,512	5,800	6	.068	1.61	.033	1.13	7,635.74
April	9,752	14,000	6	.054	1.97	.024	1.28	9,271.36
May	11,503	9,200	6	.050	2.04	.023	1.17	10,159.81
June	11,740	7,600	6	.045	2.64	.008	1.63	9,007.94
July	12,373	8,800	6	.044	2.26	.010	1.39	8,776.28
August	12,713	12,600	6	.047	2.31	.013	1.44	9,880.13
September	12,272	9,600	6	.044	2.29	.013	1.43	6,784.34

In February an 8 per cent standard was used. In March the standard was allowed to run down to 6 per cent, and a small tonnage was treated. The regenerative process was installed about May 15. The discharge samples from that date show improvement.

From the latter part of July to the latter part of August the strong storage was allowed to become empty. By this the process was shut off, there being no solution there to be acted upon. In September the use of caustic soda was tried and during the month 1,520 pounds were used, in the hope of improving the silver extraction, but the reverse occurred. In November the tanks were slimed and much solution was lost, as it could not be washed out in time for the sluicing.

It will be noticed that in the month of May the cyanide loss is less per ton of ore, but this month will not be considered in these figures as the whole month was not covered by the work of the process.

The first four months given here will be considered as typical work for the plant without the process. The last four months will be taken as showing the work of the process.

Total number of tons treated in the first four months, 38,190. Total KCY used in first four months, 49,800 pounds, less 1,200 tons of solution at 6 per cent, 7,200 equals 42,600 pounds.

Consumption of KCY per ton of ore	pounds	1.11
Average extraction, first four months:		
Gold	per cent	58.46
Silver	do	33.16
Total number tons treated in the last four months		49,098
Total number pounds KCy used in the last four months		38,600
Consumption of KCy per ton of ore	pounds	.78
Average extraction:		
Gold	per cent	75.55
Silver	do	37.97
The reduced consumption of KCy was	do	29.73
The increased extraction was:		
Gold	do	17.09
Silver	do	4.81

The above figures are taken from the cyanide plant records of the Smuggler-Union Mining Company and are correct.

BUCKLEY WELLS, *Manager.*

LIBERTY BELL.

The Liberty Bell mine has been working nearly all the year, but during the month of February on one day three snowslides came down over the company's property, killing 18 men and carrying away the ore bins at the upper terminals of the tramway, and with the ore houses two 10-ton crushers were carried down the hill. It required some time to rebuild the upper terminal, and, in consequence, very little work was done at the mill. During February, March, and April the output was very much restricted. For the year, however, the total amount of ore mined and treated at the mill was 73,916 dry tons. Instead of crushing at the mine, as formerly, the crushers have been moved to the mill and the crude ore crushed at that point, being delivered onto a belt conveyor which is actuated by a small reversible motor, and which is one-half the length of the ore bins. The entire mechanism is capable of being moved on the track over the bins, and as the belt can be reversed, the discharge can be made to empty into any bin desired. These storage bins hold 1,500 tons and are kept filled.

The ore as mined averages from $8 to $10 in gold to the ton, with very little silver.

TREATMENT PROCESS.

After crushing to pass a 2½-inch ring the ore is fed by automatic feeders to the stamps and passed through a 20-mesh screen, as much free gold as possible is plated and the tailings are then delivered to a double row of Wilfley tables for concentration.

The mill has 80 stamps, each weighing 1,050 pounds, with 100 drops per minute. Chrome steel is used for shoes and dies. The plates to the batteries are arranged in three steps, with a concave trough in front of the second step for catching any rusty gold or amalgam.

The tailings from the concentrating tables are taken by launders to the cyanide plant and fed into large wooden tanks, the slimes overflowing and being conveyed to the canvas-table plant.

The method used in the cyaniding plant is similar to that in the Smuggler-Union plant. As soon as the tank is filled with the tailings the required amount of lime is added and the charge, which averages from 150 to 200 tons, is treated with a dilute solution of cyanide.

After percolation the sands are dried by a pneumatic exhaust, which leaves about 15 per cent of water in the charge. When sufficiently dry the charge is shoveled out through gates in the bottom of the tank and dropped into a corresponding tank directly below the one being discharged. Here the sands are again subjected to treatment of strong solution of cyanide. Of the total ore crushed, 30 per cent of the weight is in the condition of slimes. These are treated in the canvas plant, which consists of a building 200 feet in length and contains three banks of tables, each table being 12 feet square. The first two banks of tables face each other and have a grade of 1⅛ inches to the foot. The third bank is on a lower level and has a grade of 1¼ inches to the foot. When the slimes are received into the building they are sized by passing through four spitz luten, which make two sizes of the slimes, each of the spitz luten receiving the same pressure in the upcast stream. The overflow from these sizers is sent to the first two banks of tables and the bottom discharge goes on the lower bank. The material caught on the tables is washed into a launder carrying the pulp to four belt machines of the Triumph pattern, but is first sized again by settling in four spitz kasten, one over each belt machine. About $1 per ton is extracted from the slimes on the canvas tables, and the product of the belt machines is very clean iron, giving a value of about $70 per ton.

The overflow from the final spitz kasten is again treated in a canvas plant of about 12 tables, and the concentrates from this set of tables gives the remarkable value of $60 per ton. The quantity recovered, however, is comparatively small. The amalgam is retorted and run into bars, which are shipped to the mint. While the zinc precipitates from the cyanide plant are treated with sulphuric acid and melted into bars, weighing on an average 250 pounds, and sent to the Omaha refinery.

MINIMUM EXPENSE OF CYANIDING.

The cost of cyaniding the sands at the Liberty Bell mill averages 45 cents a ton, including the items of labor for discharging the vats, which is contracted for at the rate of 6 cents a ton, of the cyanide used and the power employed, when a normal amount of ore is treated, using 5,000 tons a month as a basis.

TOMBOY MINES.

The Tomboy mine, located in Savage Basin, at an altitude of 11,500 feet, should perhaps be classed first in this district as a dividend producer, but does not rank as high in point of tonnage as either of the mines above mentioned during the past year. The ore, however, is of better grade, and comes mainly from the Argentine and Cincinnati lodes, situated some half a mile from the Tomboy proper.

The vein mined averages from 8 feet to 16 feet in width, and is all classed as milling ore, and averages from $15 to $16 a ton, almost all of which is gold. During the past year this vein produced 35,408 tons of ore, all treated at the new mill of the company, which yielded $534,797, at an expense of $242,960. The same year the Tomboy produced 48,644 tons, yielding $329,232, giving an average of $6.77 per ton treated, at an expense of $257,958.

This company does not cyanide its tailings, the two mills being of the same character, amalgamation and concentration, the crushing being accomplished by 1,050-pound stamps, and following the general practice of this district in using 20-mesh screens.

The new mill, which was completed during the early part of the season, has 60 stamps, and its record shows that it has averaged 4.32 tons to the stamp each twenty-four hours. The principal difficulty the mills have to contend with is a scarcity of water during the winter months.

The water used is pumped from a lake across the range, and has to be conserved in settling ponds below the mill. During the winter months the old mill will be closed. This company has completed an excellent boarding house—in fact, a hotel—for its employees at the mines.

This occupies a ground space of 150 feet by 40 feet, and is three stories in height, giving 50 sleeping rooms, all heated by steam, and the entire building is lighted electrically.

ELLA GOLD-MINING COMPANY.

The Ella Gold-Mining Company, which is controlled by the Telluride Electric Light and Power Company, has been working during the last half of the year in taking out ore from the Nellie mine. Development work has been kept up during the entire year, and consists of between 6,000 and 7,000 feet of main upraises and levels. This company has in Gold King Basin a 125-stamp mill, of which 35 stamps were devoted to treating the Nellie ore. The ore averaged $10 in gold to the ton, and was plated and concentrated, the stamps taking about 35 tons each day.

OPHIR DISTRICT.

In the Ophir district nearly all the work was done by the Ophir Consolidated Mines Company, which operated the Silver Bell-Butler properties. To their 20-stamp concentrating mill they added 30 stamps, and in this part of the mill the ore is plated as well as concentrated. The capacity of the mill is 130 tons daily, and the average value of the ore treated is from $5 to $6 per ton, which is concentrated about ten into one. The ore is sized in Hallett sizers, and in the Dimmick classifier, being handled on 4 Wilfley tables and 18 frue vanners.

The Telluride Electric Light and Power Company's plant, located at Ames's Station, a few miles below Telluride, furnishes the power used by nearly all the mills in operation within a radius of 20 miles.

SAN JUAN COUNTY.

The year 1902 was distinctly one of progress in San Juan County, nearly all the large producers of past years having increased their outputs.

The winters in the San Juan have in the past very seriously handicapped the ore production, and with decreased prices in copper, silver, and lead, and with depth gained on the veins a decrease in the general values of ore mined, the question of hauling ores to railroad has been a most vital one. This to a very great extent has been overcome by the long aerial tramways now in operation. In many instances these tramways are the only means of communication between the mines and the outer world for several months at a time, owing to the heavy snowfall and the almost daily occurrence of snowslides.

San Juan Tramways.

	Length.
	Feet.
Iowa Gold-Mining and Milling Company	16,600
Sunnyside	15,000
Silver Lake	14,700
Silver Lake, Unity Tunnel	6,000
Gold King	5,500
Gold King, American	3,300
Silver Ledge	4,000
Contention	5,300

During the past year the operating mines have given employment to an average of 1,350 men, and the actual tonnage raised, which includes the ores sent to the concentration mills as well as the crude ore shipped direct, will not fall very far short of 230,000 tons. Of this product there was shipped to the Durango smelter and the Pyritic smelter, located at Silverton, very nearly 40,000 tons of concentrates and about 10,000 tons of crude ore.

GOLD KING CONSOLIDATED.

The largest producer in the county, both in tonnage and values, is the Gold King Consolidated, its ore mined and milled during the year reaching 72,455 tons. The mill of the company consists of an amalgamation and concentration plant, with a capacity of about 200 tons a day. The 80 stamps are of the rapid-drop pattern, weighing 850 pounds each, and the screens are especially made of copper wire for these batteries and have shown a remarkable life. The gold retorts sent from the mill have reached a total value of $400,000, and the concentrates shipped amounted to 14,428 tons, with a valuation of over $700,000.

The Gold King tunnel has cut the several veins of the company's mines at a great depth, and from the Gold King proper, which was opened at a depth of 1,000 feet, some of the highest grade free-gold ore mined in the county has been extracted. It is intended to add during the coming year 100 stamps.

SILVER LAKE MINES.

The Silver Lake mines, which two years ago were sold to the Guggenheim Exploration Company, have made many improvements.

All ore mined is treated in the large concentration mill of the company, which handles about 300 tons a day. This has been enlarged, and the coming year will see an increased capacity of 100 tons a day, making a total of 400 tons.

The development work on the extensive property of this company has been very great, and the reserves of ore are claimed to be sufficient to keep the increased capacity of the mill in operation for a number of years to come.

The scheme of operation in the mill is first crushing and coarse-jigging the ore, the tailings being recrushed and sized through revolving screens and sent to Hallett concentrating tables. The middlings from these tables are reground in Chilian mills and the product passed over stationary canvas slime tables. The tonnage shipped from the Silver Lake mills during the year was 13,350, entirely lead concentrates.

THE SUNNYSIDE.

The Sunnyside mine has taken third place as a producer and during a large part of the year has kept both of its mills busy, they being of 30 tons and 100 tons daily capacity. Both are amalgamation and concentration. During the year they shipped 4,742 tons of concentrates, some 15,000 tons of ore going to both mills.

NORTH STAR.

The North Star, on Sultan Mountain, at one time the greatest producer in the county, up to the first of the year had lain idle for nearly ten years. Early in 1902, however, the property came into possession of the reorganized Silverton Mining Company, which worked it until driven out by water. It is claimed that in the deep workings a large body of good grade ore was encountered. An expensive plant for taking care of the water has been installed. A concentration mill has been erected.

GRAND MOGUL.

The Grand Mogul property is located on upper Cement Creek, on the system of veins which cross from the Gold King to the Sunnyside, and, while not having been a heavy producer during the year, has shipped a number of cars of ore and kept up continuous development work. A large concentration mill be erected.

The Esmeralda is a new producer. During the latter half of the year it shipped 100 carloads of ore carrying from an ounce to 1½ ounces in gold and as high as 100 ounces in silver.

The Highland Mary mine, now incorporated as the Gold Tunnel and Railway Company, has become a shipper and is worked through the Gold Tunnel. This cuts the vein at a depth of 1,500 feet. A 150-ton concentrating mill was built and is working successfully.

RED MOUNTAIN DISTRICT.

In the Red Mountain district a great deal of development work and prospecting has been done, but no new shippers have been recorded, the low prices of silver and copper preventing in many instances, the taking out of ore which could be handled under more favorable market conditions.

Among the older mines in this section which have shipped at intervals are the Brooklyn-Bonner, Yankee Girl, Gennesee-Vanderbilt, and Silver Ledge. The last named has just completed a 200-ton concentration mill.

KENDRICK-GELDER PLANT.

The Kendrick-Gelder Pyritic Smelter, at Silverton, has only run during the summer months. As a large part of the ore treated carries considerable copper, the production of a very good grade of matte is secured. This is concentrated by being resmelted with the addition of copper ores so that a matte is finally produced running 50 to 70 per cent in copper with high gold and silver contents. This furnace is run with a hot blast and does not use over 6 per cent of fuel. As the charge can be run with a much higher proportion of silica in the slag, and no roasting is required, the cost of smelting is materially reduced over the lead furnace. A very large part of the crude ore of the county found its way into the bins of this smelter while it was running.

OURAY COUNTY.

Ouray County's precious metals production for 1902 exceeded that of any previous year; 1,465 cars of ore and concentrates were shipped from the town of Ouray.

By far the greater proportion of values shipped were contributed by the two notable properties of the county—the Camp Bird, Limited owned by the Venture Company of London, England, and Revenue Tunnel Mines Company, which controls the Virginia Mine. A number of other mines contributed to the general output, but with the low price of silver, and the large cost involved in handling, freight, and treatment at the smelter, many properties which were formerly shippers have either shut down or only shipped occasional lots of ore.

The Red Mountain district has done very little except development work during the year. But the remarkable production of the Camp Bird group, in Imogene Basin, has stimulated prospecting in that vicinity, and a number of companies have been formed to operate the different claims.

REVENUE TUNNEL COMPANY.

The Revenue Tunnel Mines Company is owned by a very few individuals and is probably one of the closest corporations in the State. For several years this company has been pushing its main tunnel from the Ouray side to the Telluride side of the range, and at the same time has pushed the tunnel from the Ophir side in San Miguel County to connect with the Revenue Tunnel. This was accomplished during the past year and gives a continuous tunnel through the mountain of about 5 miles in length. The Ophir tunnel was started at an elevation of some 400 feet above the Revenue and the two were connected by an incline. While driving this incline a new vein was cut which is said to contain phenominal values in gold. It is stated that this vein is fully as rich as the Montana vein which was cut a year ago and which shipped two cars of ore averaging 10 tons each, which, report says, gave returns for $20,000 in gold. The new vein is reported to assay about 10 ounces in gold per ton for its entire width. The underground workings have a total length of 35 miles with depth of over

3,000 feet from surface at the lowest workings, giving that much stoping ground. The Revenue tunnel, through which the mine is worked, is over 3 miles in length and provided with electric trolley cars for hauling out ore and carrying in supplies.

A main shaft connects the tunnel with surface, a distance of over 2,400 feet. The vein extends the entire distance. A number of test shafts have been sunk and in each case the vein has widened and improved in value with depth.

Aside from the surface plants, which include a mill at the Revenue portal, and another at the Ophir portal, both of which are concentration plants, there are 4 electric power plants and one of the finest machinery equipments in the State. Owing to the large bodies of gold ore now opened up, the compay expects to change its mills so as to handle this character of ore as well.

CAMP BIRD, LIMITED.

The Camp Bird property, which includes a large number of claims, was discovered by Mr. Thomas F. Walsh in 1896, and sold by him to the Venture Company of London, England, in the early part of 1902. The mine produced up to the beginning of the year 127,000 tons of ore, having a value of $4,536,885, or a value per ton of $35.72. The profits during this period were $2,994,778, of which $650,000 were expended in the erection of the plant and in purchasing additional mining properties.

The ore is almost entirely free milling quarts and is treated in the original mill of 60 rapid-drop stamps, weighing 850 pounds each and using slotted screens, giving issue equivalent to 26-mesh. The bulk of the values are saved on the plates and, after sizing, the tailings from the plates are concentrated on Vanners and 4 Wilfley tables. The tailings from these tables are classified in Spitz Kasten and the sands are distributed in the tanks for cyaniding. Nothing is done with the slimes, as they are practically valueless.

CAMP BIRD CYANIDE PLANT.

In the cyanide plant two sets of tanks are installed for double treatment, one above the other. These handle about 175 tons each. Two other tanks for single treatment have a capacity of 225 tons. These are to be installed for double treatment when the mill is remodeled. The principal change is to add Huntington mills for regrinding the tailings from the concentration tables and subject them to another plating, as the principal difficulty in amalgamating is the fact that the gold is not liberated by fine enough grinding.

ONE MONTH'S PROFIT.

The report of the Venture Company to Camp Bird, Limited, stockholders for October, 1902, showed a profit for the month of a little more than $151,000, after paying all mining and milling expenses, new equipment, expert fees, and the London office expenses. There remained in the stopes of the ore mined during that month more than one-half of the ore broken down. Had all this been milled, the net profits for the month would have been nearly $350,000. The milling capacity is about 200 tons a day, but it is the company's intention to increase this during the coming year, and it is reported that they will erect at Ouray, 8 miles from the mine, an electric power plant of 500 horsepower and transmit this power to the mines and mill.

OURAY CHIEF.

During the past year the most promising new property which has been developed is the Ouray Chief. This is new in the sense that it has developed into a shipping proposition. It has a very strong vein of manganese and galena, and carries a value which will average from 55 to 60 ounces of silver and about $12 in gold to the ton. The tunnel is now in 845 feet and cuts the vein at a distance of 550 feet.

OTHER PROPERTIES.

The American Nettie, in the Sneffles district, was actively worked during the year. The mill handles all its output and is of the ordinary amalgamation pattern, the ore being entirely free-milling.

The Khedive, which adjoins the Bachelor mine, is worked through the latter property and sends all of its ore to the Bachelor mill, which is well built for concentrating and equipped with rolls for grinding, sending its product to a single coarse jig, and after regrinding the tailings the pulp is sized and sent to 4 Bartlett and 4 Wilfley tables.

The Hudson, located in the Red Mountain district and controlled by the Blue Bell Company, shipped some 30 cars of ore during the year. This ore averaged about 10 per cent of copper.

Among the other properties which shipped during the summer from this district, during intervals, were the Yankee Girl, Governor, Congress, Guston, Genesee-Vanderbilt, Enterprise, Carbonate King, and Sailor Boy.

In Poughkeepsie Gulch, the Tempest mine shipped several cars of ore carrying good values in gold, silver, and lead.

Another shipper in the same district was the Picket, giving values in gold, silver, and copper; the O. N. group and the Ruby Trust.

OURAY'S SMELTER.

In the town of Ouray is a local smelter, which has run intermittently, but finds great difficulty in securing proper ore for treatment. As the furnace is constructed for pyritic smelting, the need of heavy sulphide ores is imperative, and the nearest point where they can be procured is in the Red Mountain district. The cost of handling the low grade iron-copper sulphides from that section makes its questionable if the furnace can be profitably run, as nearly all the ores in this vicinity are silicious, carrying either lead or zinc sulphides, or both.

MINERAL COUNTY.

The mines in the vicinity of Creede, during 1902, while yielding a reduced shipping tonnage, have shown increased values. The decrease in tonnage is estimated at about 8,000 tons; explained in part by the much larger quantity of ore concentrated, which also accounts for the increased average of values.

A most noticeable feature in the history of several of the mines is the increased gold values as depth is attained. This is especially true in reference to the United Mines properties, which are worked by the Big Kanawha Leasing Company, and consist of important claims on the Bachelor Mountain vein. In the New Discovery, Happy Thought, Golden Eagle, and Argenta, the ore extracted was practically a silver-lead and shipped as such, the silver contents running very high, but when the 1,100-foot level was reached the character of the values changed and some gold was found. This has continued to the 1,400-foot level, until the ore at present extracted is practically a gold ore, ranging from one ounce to four ounces in value, with little silver present.

A great deal of deveolpment work has been accomplished during the past year on the three great veins of the district, especially on Campbell Mountain; and an advance has been recorded in largely increased milling facilities, making the county rank second in the State in the production of zinc ore and fourth in the production of valuable metals.

BIG KANAWHA.

Probably the Big Kanawha Company has been the largest producer during the year, most of its output going direct to the smelter. A long-time lease was obtained by it on the New York and Del Monte claims, which two mines had been in litigation for the past eight years.

The Del Monte at once entered into the list of large producers. The past year the Del Monte has produced on an average some 2,000 tons of ore a month. About 700 feet is the greatest depth attained.

THE COMMODORE.

The Commodore mine, formerly the largest producer in the camp, has kept steadily at work. During the last half of the year, however, the flow of water encountered in sinking a new shaft, with the breaking down of the compressor, flooded the lower workings. A new pumping plant was installed. When completed this will be one of the largest and most perfectly appointed in the State.

The Bachelor mine has been worked steadily by leasers.

CAMPBELL MOUNTAIN VEIN.

The Campbell Mountain vein has had continuous work done on it during the year. The East Willow Mining Company, owning the Solomon, Ethel, and Moses claims, are all on the same vein. The ore is very largely of a talcose character and consists of lead and zinc sulphides disseminated through the mass, and carries some gold. The lead and zinc contents will average about one-fourth of the whole ore mined, which is treated in a concentrating mill of 50 tons daily capacity.

The average output of the mill is about 7 tons of zinc and 8 tons of galena, both of excellent grade, for each twenty-four hours. The mill is provided with four 4-compartment Hartz jigs and a Wilfley table, which has been changed by the superintendent so that it produces two grades of zinc and lead concentrates, a very ingenious device being placed at the discharge end of the table, whereby the very fine flour lead is screened out through a 60-mesh into a separate launder. The management considers the device very valuable and claims to effect a saving which can not be accomplished in other ways.

A very large quantity of ore is blocked out in the claims belonging to this company, enough to keep a much larger mill in operation for several years, and it is the intention to double the mill's capacity.

The Ridge mine, on the same vein, and which was the first mine to treat this class of ore and ship zinc ore as a product out of the State, has been only worked by leasers in the upper levels, as the mine is in litigation, and the lower workings flooded with water.

The Monte Carlo has produced some ore of excellent grade. Its main work, however, has been in developing large bodies of low grade, similar to that of the Solomon and Ridge. It awaits the addition of a concentrator to be a large producer.

SUNNYSIDE DISTRICT.

The Sunnyside district, lying near the town of Creede, and which holds the McKinzey Mountain vein, has shipped a large amount of very high-grade silver ore during the year.

The Corsair has been the largest producer, and has a quantity of ore blocked out. As depth has been gained, the grade of the ore has improved.

The Alpha and Nelson have been worked by leasers and have shipped considerable ore.

HUMPHREY MILL COMPLETED.

The most important addition to the industry of Mineral County during the past year is the completed Humphrey concentrating mill, which is a model in all details. Its present capacity is 200 tons a day, and the mill has been in constant operation during the year. The mill treats almost entirely the low-grade ore from the United Mines, the ore being brought to the surface through the Nelson tunnel, and then by surface tram to the storage bins of the mill.

The Humphrey tunnel, which is an extension of the Nelson tunnel, has been driven so that it is now 3,000 feet beyond the old breast of the Nelson tunnel, cutting the entire ground controlled by the United Mines Company. This has in large measure accounted for the greatly increased output of that company, which is intimated to have been over 40,000 tons during the last twelve months.

CHAFFEE COUNTY.

Chaffee County has noted considerable activity in the comparatively new district around Turret and in the camps at Manoa and Sedalia.

The principal interest has centered at Turret and ore has been produced running well in gold values.

The Vivandiere Mine, one of a group operated by the Twin City Company, has a shaft 565 feet in depth. During the year a good pumping plant was installed. The ore has followed the shaft to its present depth, and for some time this property has been shipping a car a day of good ore, value largely in gold.

TURRET-INDEPENDENCE.

The Turret-Independence has had pay ore from surface and has shipped considerable to the smelter. It runs from $25 to $30 in gold to the ton, with a medium-sized streak carrying as high as $40. It also carries some copper and a little silver.

Considerable development work has been carried on during the year, and among the most active properties were the Twin City, Holdredge, and Mascot. The Holdredge has been driving a long tunnel to cut its vein, incidentally to open up several of its other veins. From its L. S. claim a number of shipments have been made, carrying as high as $100 to the ton.

The Sunset Consolidated, in Manoa district, 3½ miles from Turret, is a new enterprise getting into shape.

The Mascot was organized only recently and will develop six claims in Turret district by means of a tunnel 1,000 feet in length. The tunnel is already driven 200 feet and the ore assays as high as $60 a ton in gold.

SEDALIA COPPER MINE.

The Sedalia copper mine, noted as the only existing copper mine in the State, did not produce much ore during the year, but development work was carried on and the property has been leased to a company which will at once begin the erection of a lixiviation plant to extract the copper values on the lower grades of ore mined.

In the Monarch district very little was done.

NEW SMELTING PLANT.

Probably the most important work accomplished during the year in Chaffee County was the erection, near the town of Salida, of the Colorado and Ohio Smelting and Refining Company's plant. As this is the only independent lead smelter at present in Colorado, it has been watched with great interest. It is one of the largest smelters in the the State, having a capacity of 1,000 tons a day, with ample accommodation for doubling this if required.

The power-house is of pressed brick, and is 80 by 160 feet. It is divided into four compartments—boiler room, engine room and two blower rooms. An electric plant is included in the machinery for lighting the grounds and works. The interior is finely finished and the floor concrete throughout. There are three boilers, with sufficient room for double that number. The engine is a 550 horse power Corliss, and originally furnished a great part of the power at the Buffalo Exposition. There are four large blowers. There are two furnace buildings completed, one elevated 6 feet above the other, although the charging floor of each building is practically on the same level.

The lower or lead furnace building is 40 feet wide by 120 feet long and contains four furnaces, each having a capacity of 150 tons a day.

Just back of this building stands the smelter furnace building, 40 by 60 feet, and accommodates two furnaces having a combined capacity of 500 tons a day.

GREAT FLUE CHAMBER.

Between the two buildings is the great flue chamber, which extends some 823 feet and is 24 feet wide at the bottom and arched at the top.

This flue is built of steel laths and concreted, both inside and out, with cement. The stack for the furnace is 150 feet high and has a cross section of 20 feet at base. The ore beds for this plant have a capacity of 80,000 tons. Constructed with the plant is a very complete sampling works.

Up to the first of the year 1903 no roasting furnaces had been built, owing to the fact that a sufficient supply of oxidized ores could be obtained from Leadville to keep the smelter running without roasting the ore. It is the intention soon to erect roasters.

Ground has been broken for a 100-ton refining plant. The owners of this smelter are very largely interested in New Monarch and adjacent properties at Leadville, and are able to draw a large part of their ore from their own properties. The smelter had no difficulty in securing contracts for ore from Leadville, Creede, and other points in Colorado and Utah.

DOLORES COUNTY.

Rico, the principal mining point in Dolores County, has been very quiet during 1902, the only ore shipped being small lots of high grade gotten out by leasers, and small lots from an experimental plant owned by the United Rico Mines Company and the new mill owned by the Pro Patria Company.

A VAST CONSOLIDATION.

Early in the year an effort was made by Mr. P. S. Rider, manager of the Enterprise Company, and others, to consolidate the various great enterprises and satisfactorily adjust and prorate the various interests of so many companies into one combination. It has been a very great undertaking, but the close of the year finds the enterprise fairly launched. The mines which have entered into this combination are the following well-known properties and formerly large producers: Rico-Aspen Consolidated, Enterprise, Black Hawk, Atlantic Cable, Rico Deep Mining, Grand View, Hope and Cross Group, Rico Smelting and Mining, Colorado Milling and Concentrating, Keystone Placer, and the Rico Milling and Mining Company.

A DIFFICULT ORE.

A very large part of the ore at Rico consists of a galena mixed with iron, zinc, and copper sulphides, the zinc and iron often predominating. This combination is a very difficult proposition for the metallurgist to handle, especially the separation of the zinc and iron sulphides, as their specific gravities are so nearly alike that ordinary methods of separation do not materially affect them, and the saving of high percentages of either of these minerals has been only fair, with large losses in the tailings.

INTERESTING TESTS.

The work accomplished in the test runs in a small mill treating the ore from the Atlantic Cable mine during the latter part of the year has been in some respects remarkable. Very little gangue is visible in this ore and the concentrates are generally a product obtained from an average of two or three into one. The concentrates give a very clean mineral, free from silver, containing all the different sulphides. The ore is first crushed and then sent to the twenty stamps, thence to the Frue vanners, after being sized by passing over pointed boxes. The lead, iron, and zinc are made into two products, the lead kept by itself.

The iron and zinc product is then passed through what is known as the National Magnetic Mineral Separator. This takes out the magnetic iron pyrites, of which the mixture carries about 40 per cent, and the balance of 60 per cent is put through a light roasting furnace and returned to the magnetic separator, where nearly the entire balance of the iron is extracted. This separator consists of three canvas belts revolving in the fields of three different electro-magnets, each of which is of a different magnetic strength, the roasted or mixed ore passing over the belt affected by the weakest magnet first, and, following, to the stronger ones. During the test runs the following products were obtained and shipped:

Concentrates.	Tons.	Per cent Zn.	Per cent Fe.	Per cent Pb.
Zinc	87.60 252.70 361.89	51.17 53.17 46.30		
Iron	132.35		59.11	
Lead	203.00			44.84

ORE MADE PROFITABLE.

The zinc concentrates did not carry, at the highest, over 3 per cent of iron, and the iron concentrates only showed some 4 to 5 per cent of zinc, the lead concentrates showing in the majority of cases a low percentage of zinc, although several lots gave over the limit of 10 per cent allowed by the smelter. Mr. Rider feels confident that he will be able to improve these results, and as soon as he has done so, will erect a large mill for treating this class of ore.

The results obtained above have made a profitable ore out of one which two years ago was absolutely worthless, as the zinc in the ore before effecting the separation was simply prohibitive, while now the zinc by itself is worth $25 a ton. The clean iron procures a bonus on the iron in addition to gold and silver values contained, and the lead is a valuable product in demand at the smelters.

NEW PRO PATRIA MILL.

The Pro Patria people have erected a 100-ton water-power concentrating mill; it is a well-built jig mill. A tramway 3,600 feet long connects the mine and mill. It was the original intention to work the ore entirely on jigs, but at present the plan is to put in tables and treat the middlings from the jigs after regrinding. This mill has a separator of the magnetic variety and also roasts its concentrates before treating. The mill was finished only about the end of the year, and the clean zinc concentrates obtained amounted to very nearly 150 tons and averaged 54 per cent of metallic zinc.

At Dunton, a little town on the West Dolores River, the Emma group of mines has been in active operation. This group has a concentration mill of 125 tons daily capacity, and has produced a large quantity of gold concentrates.

HINSDALE COUNTY.

Hinsdale County in 1902 did not equal past records in tonnage or value, but a number of mines report good bodies of ore opened up.

While these are low in grade and often very base in character, they are amenable to treatment, and several new mills are projected.

BURROUGHS PARK DISTRICT.

The most interesting feature of the year is the development of some promising veins in the Burroughs Park district. The properties upon which most work has been done are the Isolde, Bon Homme, and Tobasco groups. The Isolde produced 350 tons of high-grade ore carrying considerable sylvanite. The workings are not extensive, consisting of tunnel work almost entirely, with stopes from which the bulk of its output was extracted.

THE BON HOMME.

The Bon Homme is an immense vein, which has been developed by a crosscut tunnel 1,700 feet in length, cutting the vein at a point some 970 feet from surface. The vein was crossed for a distance of 60 feet without finding the other wall. Several streaks of smelting ore, from 4 to 5 feet in width, were cut, while the balance is milling ore. The character of the ore seems to be mainly a chalcopyrite, with considerable quartz.

THE TOBASCO.

The Tobasco is another very large vein which has been opened up by crosscutting with a tunnel. This company has proved its vein for nearly 1,000 feet. It has a width of from 5 to 18 feet. The ore is somewhat similar to the Bon Homme, but carries lead in addition. The Tobasco completed a very large and expensive mill plant during the year. The mill is located below the mine and connected with it by a tramway. Power is furnished from an electric-power plant situated some 9 miles away. The extremely early and long winters in this district make the question of securing water power a very doubtful one, but the company has secured the rights on a small stream and intends to erect a high dam across the gulch and store water. The mill is built as a concentrating and cyanide plant.

LAKE FORK DISTRICT.

The Lake Fork of the Gunnison has been a very prolific district in past years, containing such well-known properties as the Ute and Ulay, Golden Fleece, Black Crook, Contention, and Monte Queen, while the Henson Creek district has the Henson Creek lead mines, Red Rover group, and Hidden Treasure. On nearly all of these some little ore has been extracted.

The Ute and Ulay is sinking a large working shaft. The Golden Fleece, which a few years ago shipped phenomenally high gold values, is being worked almost entirely by the leasing system and is in low-grade ore. This company has an excellently constructed mill.

The Hotchkiss Mountain M. and R. Company have shipped about 150 tons of ore.

RED ROVER GROUP.

In the Henson Creek district the most active property is the Red Rover group. This company drives mill and compressor by electric power and transmits the power a distance of 1¾ miles. The mill has a capacity of 50 tons in two eight-hour shifts, and consists of 5 Hartz jigs, all of which use punched steel screens, and 3 Wilfley tables. It is the intention to add a canvas table plant to handle the slimes, which are now returned to the Wilfley tables. The average value of the product, as sent to the smelter, is gold, 0.08 ounce; silver, 34.32 ounces, and lead, 32.7 per cent. A small copper valuation is occasionally added.

Very large bodies of low-grade ores carrying heavy zinc contents exist in this county, and it is simply a question of time when, with modern zinc-separating machinery, these ores will be treated satisfactorily.

The Hidden Treasure mine shipped some 300 cars of ore and concentrates to the Salida smelter during the latter part of the year.

GUNNISON COUNTY.

The mining districts of Gunnison County are so large and the camps so far from railroad, as a rule, it requires an exceptionally good grade of ore to stand—first, the long haul by team, and then bear the freight rate across the range to the nearest smelting point.

In the southern gold belt a good deal of work has been done. At Dubois the Davenport tunnel worked the entire year, cutting several veins of low-grade ore. The Adair and Dubois companies have extended their tunnels.

In the Spencer district the Headlight has made surface improvements and the Old Lot mine has shipped ore of good grade.

VULCAN DISTRICT.

The Vulcan district has produced some remarkably rich gold ores, the principal shipper being the Good Hope. At the 500-foot level a very rich body was opened, averaging 3 feet in width and running from $200 to $1,700 per ton in gold. One car was shipped which ran $17,500. This property has shipped as high as 40 tons a week.

In the Cochetopa district the Colorado Mines Consolidated Company has erected a 10-stamp mill and extended the Standard and Stirling tunnel 1,000 feet. The property shows a large body of low-grade ore.

The Maple Leaf has a good body of ore.

TOMICHI DISTRICT.

The Tomichi district, in the eastern part of the county, has been the scene of considerable activity, both in development work and in the erection of a new smelting plant.

The Southwestern smelter was completed and operated for a short time. The Tomichi Valley smelter successfully treated the ores from this district.

WHITE PINE.

At White Pine the Akron has been steadily at work pushing its long tunnel into Lake Hill. It is now considerably over 2,000 feet.

The object is to cut the North Star and May-Mazeppa veins.

The David H. is a new property and has produced some good ore. The Pocahontas has also shipped.

The Eureka and Erie have been worked, and their ore was concentrated at the Tomichi mill.

Ohio City, and the Gold Brick district generally, has been active.

The Cortland mine was a regular shipper, its ore frequently running as high as $100 to the ton, mostly gold values.

The Ashland has driven the Carter tunnel, now 1,200 feet long.

The Chloride, in Jones Gulch, has shipped from $60 to $70 gold ore.

The Pitkin Gold Belt Company, operating the Whig group, has equipped the property and opened up several chutes of ore.

The Williams, a new property, has made some shipments and done considerable development.

The Granite Mountain is being worked through a 1,000-foot tunnel. The Calumet has also been a producer.

BOX CANYON DISTRICT.

In the Box Canyon district, between Ohio City and Waunita, is a new and undeveloped field. During the latter part of the year the Revenue mine was opened up and showed a vein of 6 feet in width, running very well in gold.

In the Quartz Creek district the Maid of Athens and Citizen mines have uniformly produced.

TIN CUP.

The Tin Cup district, which includes Taylor Park and its placer fields, has had an active year. The fact that the Taylor Park railway surveyed its line through this district has given impetus to the mining industry all along its right of way.

The Enterprise mine, a new property, opened up a vein 17 feet in width, and the ore shipped netted about $60 gold to the ton. When the road is completed this property will be a heavy shipper. The company also owns about 3,000 acres of placer ground in Taylor Park.

The Dora, which owns 750 acres of placer ground in Union Park, is making extensive preparations. About $125,000 have been expended in constructing reservoirs, dams, ditches, and flumes.

The Hepburn placer produced considerable gold.

The Robert E. Lee and Gold Cup each shipped some ore

RICH GOLD ORE.

At Pittsburg, the Augusta mine has developed largely. The 320-foot level on the Dark Canyon side of the mountain has a length of over 1,200 feet, and 700 feet of this is continuous ore body. The last 100 feet encountered a very rich vein of ruby silver, associated with some high-grade gold ore. This is said to be the richest gold ore ever encountered in the Augusta mine, and frequently assays as high as 500 ounces gold to the ton.

PITKIN COUNTY.

The productive mineral area of Pitkin County is located around the town of Aspen. On every side the great contact formation occurs, and in the workings of the Smuggler, Argentum-Juniata, and Mollie Gibson properties the valley itself in which the town is built has been crossed hundreds of feet below the streets and dwellings. As Aspen always has been essentially a silver-producing section the gradually lowering price of that metal has had a most discouraging effect. One by one the past famous producers closed down, so far as company work was concerned, and for several years a large part of the output has come from lessees.

SMUGGLER'S LARGE CONTROL.

During 1902, however, the Smuggler obtained, through lease, the control of nearly all the old properties, and is handling a very large tonnage. Its two mills have a daily capacity of about 500 tons, and they have run to their full capacity. The Aspen Mountain side of the town is known as the Durant Company and the Smuggler Mountain side as the Smuggler Company, but both sides are under one and the same management. The Smuggler mills are well equipped for concentrating the lead-silver ores, and have added Frue Vanners for treating the slimes produced, coarser crushing for jig work, and treatment on the Hallett tables. The ores also carry quite a percentage of zinc, which is separated successfully, and forms a product in the mill work. The company pay roll carries the names of 500 men in their mining and mill work.

PERCY CONSOLIDATED.

The only other large company at work is the Percy Consolidated, whose mines are located about 2 miles from Aspen. This company is mining about 200 tons of ore each day, part of which goes to its mill, the balance being of high enough grade to ship in crude state.

The Percy Consolidated has averaged a shipment of about six cars a day during the year, and returns are said to be satisfactory. This company employs about 100 men in mine and mill.

LA PLATA COUNTY.

Some excitement has been exhibited in La Plata County owing to rather unusual occurrences of gold in the Neglected mine, situated in the La Plata Range, a few miles from Durango. A good deal of prospecting has been done and small shipments made from different claims. As a rule the veins are very narrow, though high in grade, the values being very largely gold tellurides.

The Neglected mine has shipped some ore of very good grade to the Durango smelter, but it is reported to have stored most of the high-grade ore extracted, as the mine has been in litigation during the year.

Another property, the Durango Girl, bids fair to become a good producer.

MANCOS DISTRICT.

On the Mancos side of the La Plata Range considerable prospecting has been done, and some of the ores have been treated at a 10-stamp mill, but values have diminished with depth and the oxidized ores changed into iron sulphides.

DURANGO SMELTER.

The Durango Smelter has had a successful year and is replacing the old furnaces with larger ones. The ores treated at this plant of the American Smelting and Refining Company are very complex, containing nearly everything objectionable from the metallurgical standpoint, in addition to the fact that the large proportion of. receipts are concentrates. Instead of bricquetting these fine ores, they are roasted in long reverberatory furnaces, sintered to condition, and then smelted, enough sulphur being left in the ores to produce a copper matte. One furnace is reserved for concentrating the matte, which, as a finished product, runs as high as 50 or 60 per cent in copper, also carrying high values in gold and silver. Efforts are made to produce a better grade of bullion at the lead furnaces, as the lead from the well is now tapped into slag pots and skimmed and then ladled into moulds. The pigs of bullion are taken to a melting kettle and remelted again, being skimmed on allowing the lead to cool.

The object is to get rid of the dross and make a much more homogeneous bar than that produced by the old method of ladling direct from the furnace lead well into the moulds, and shipping the resultant pigs.

The dross obtained from the skimming is recharged into the furnace, and as it is always of high metallic value helps to enrich the subsequent bullion produced.

During the past year there was added a new power plant, which is placed close to the Animas River, below the furnaces, and consists of three very large Corliss engines, all connected with one main driving shaft, but can be severally disconnected at pleasure. The blowers and dynamos are in place and the large pumping plant is working with a nominal daily capacity of one and one-half million gallons. When completed, this power plant will be one of the finest in the State.

SUMMIT COUNTY.

Very little progress can be recorded for Summit County during 1902. In the various districts the mines have held their own in the matter of output, but the prevailing low prices for silver and lead have affected many properties and, in some instances, the margins have been so small that the owners have preferred to close their properties.

At Robinson, during a few months, the Robinson smelter produced some matte. The Ten Mile Leasing Company sank a shaft to catch the Robinson vein, but the work did not meet expectations. Altogether, some 200 tons of ore were shipped from this camp for the year.

At Kokomo considerable activity was evidenced. The bulk of the ore mined at this point is of just sufficient value to permit of mining and shipping, the principal value being in silver and iron contained.

On Elk Mountain the following properties shipped: Eagle, Delaware, Summit, Kimberly, and Wilfley. The Eagle Company probably produced the largest tonnage, averaging about 40 tons a day, but the ore rather depreciated, running about $10 a ton.

SUMMIT MINING AND SMELTING COMPANY.

The Summit Mining and Smelting Company has been a constant producer, its ore carrying a large percentage of zinc. It has a mill. After being crushed the ore is handled on Wilfley tables and the concentrates are passed over a Wetherall Magnetic Separator to extract the iron from the zinc sulphide. A roasting furnace will be added, giving a slight roast to the concentrates, with the expectation of rendering more of the iron magnetic and taking out a larger percentage of that metal. As the iron contents decrease the zinc percentage increases; a higher price is paid for the cleaner ore. The average output of this company was about 25 tons a day.

The Kimberly mine produced about 3,000 tons during the year, and the Wilfley mine about 2,500 tons.

On Sheep Mountain the following properties produced: Michigan, Washington, Snow Bank, and United States.

On Jack Mountain, the Queen of the West, which in the past produced some high grade silver ore, has been working intermittently.

The Wintergreen shipped about 3,000 tons of very low grade iron sulphide ore.

In the Mayflower district, on Fletcher Mountain, the Bird's Nest group shipped about 200 tons of ore, averaging as high as two and one-half ounces in gold and twenty ounces in silver to the ton.

BRECKENRIDGE DISTRICT PLACERS.

In the district surrounding Breckenridge the principal work has been the completion and operation of the American Dredging Company's placer plant on Swan River. During the short season of five months in which the dredges were operated, it is stated that fully $100,000 in gold was saved, the first year of operations, and as only the beginning of their ground has been touched, the future of this company seems to be very bright.

The Gold Pan Company, which owns a large territory on the Blue River, just above Breckenridge, has spent much money in construction of an immense dumping ground, as all of their tailings have to be elevated. A large pit was excavated to reach bed rock and a long flume built to take the entire water of the Blue, around the pit. The season was consumed in getting down to bed rock, at this point 40 feet below the surface, and the work was impeded by the presence of bowlders, many of which weighed several tons. But the work of lifting these out of the pit with a very large stone bolt is accomplished by a fine mechanical arrangement of cables and cranes, the stone bolt depositing its load at the desired point automatically. The Evans hydraulic elevator has been installed and is being used successfully in the pit.

FRENCH GULCH DEPOSITS.

On French Gulch some very rich placer deposits were found on the Mecca Company's property. The pay streak averaging from $10 to $15 to the cubic yard, and at one place running as high as $42.

In the vicinity of Breckenridge lode-mining interests were not very active.

Probably the mine which produced the largest amount of value was the Cashier, in Brown's Gulch. This property is equipped with a 20-stamp mill.

On Bald Mountain the Mountain Pride started work in April and shipped 503 tons of ore, which averaged about $27 to the ton.

In the Swandyke district a good deal of prospecting was done.

CARBONATE, A NEW PRODUCER.

The only new producer in the vicinity of Breckenridge was Carbonate mine, on Nigger Hill, which sent out three car loads of ore averaging $50 to the ton in gold, silver, and lead.

On Mineral Hill the June Bug had four cars, averaging $70 to the ton.

Montezuma was fairly active during the year. The Pride shipped 1,000 tons to the smelter, and the Mines Development Company, working the California Bell tunnel, produced 350 tons of good grade.

At Rathbone the only regularly producing property was the Pennsylvania, which output 800 tons of ore and concentrates.

PARK COUNTY.

During 1902 Park County just about held its own in its output of the precious metals. For a number of years the great London mine has been a steady producer. Some excellent ore was opened up during the summer, averaging as high as $100 to the ton in gold, copper, lead, and some silver; but on account of bad air work was prosecuted in other parts of the property until connections could be made to improve the air conditions. About 1,500 tons of ore were marketed from the old workings during 1902.

SMALL SHIPPERS.

Among the properties which have made small shipments during the year are the No End, on Bross Mountain; the Orphan Boy, in Mosquito Gulch; the Fanny Barrett, on Loveland Mountain, and the Ling mine, on North Star, in Montgomery Gulch.

In the Horseshoe district the Hilltop did a little development work and took out some ore, and the Peerless Maud, in the same section, has been in some very good lead ore.

In Buckskin Gulch and other districts a good deal of prospecting and development work has been carried on.

PLACERS.

The principal interest in Park County is centered about its placer mines. The Snowstorm placer was worked vigorously during the open months and, considering the scarcity of water, made a satisfactory showing. This ground is worked by the hydraulic method, undercutting the gravel with giants and washing into long sluice boxes. The ground is estimated to carry values of 50 cents to the cubic yard.

The Cincinnati placers, at Fairplay, have done some work during the season, but suffered from scarcity of water.

The Lowe placer, at Fairplay had a short season, being sold early in the year to the Kansas and Colorado Hydraulic Gold Mining Company. It is expected this ground will be actively worked the coming season.

The old Alma placer had a successful season as long as the water lasted. For over thirty years this ground has been worked.

FREMONT COUNTY.

Fremont County lies partly in the foothill range of central Colorado and has, at times, been the scene of mining excitements. These have, however, usually been temporary and confined to surface deposits of the precious metals, which, until the past year, have not shown continuity.

At Dawson, a mining camp a few miles from Canyon City, the county seat, the Copper King Free Gold Mining Company, during the early part of the year, completed a concentrating mill and treated some 500 tons of ore. The Copper Boy mine also produced some ore.

COPPER GULCH PROPERTIES.

In Copper Gulch, about 15 miles from Canyon City, a number of mines have been worked almost continuously during the year, shipping some ore of exceptionally good grade in copper and carrying fair values in gold and silver.

The Greenhorn Mountain Mining Company, working in Copper Gulch, completed a lixiviation mill during the last of the year and successfully handled the oxidized ores from their properties.

In the northern part of the county, considerable prospecting has been carried on in the Currant Creek district, showing large bodies of zinc and silver-lead ores.

CHEMICAL MILLS.

But the topographical position of Fremont County in relation to the great gold producing section of Cripple Creek has made it, with its immense coal and oil deposits, a natural mill center for handling the ores from that district. Hence some of the largest and most successful cyanide and chlorination mills in the State have been built in this county.

At Canyon City, the United States Reduction and Refining Company's smelting plant has been established for some years. Also at this point the Empire Zinc Company, a branch of the New Jersey Zinc Company, has a large concentrating mill for handling zinc ores contaminated with iron and lead sulphides.

The United States Reduction and Refining Company have extended their plant very materially during the year, adding new fume chambers, roasting and calcining furnaces and are now making barrels for their finished product, a zinc-lead oxide used as a substitute for white lead in paint manufacture.

REFRACTORY ZINC-BEARING ORES.

The process of manufacture is quite interesting. The ores purchased are generally the extremely refractory zinc-bearing ores of the different sections, and if these contain iron, lead, and copper sulphides, which they usually do, it is simply so much better for the process. After crushing, the ores are subjected to a very strong roast in order to drive off the zinc and lead contained, in the form of oxides, which are carried by means of powerful exhaust fans into the bag rooms, where the fumes are caught in bags. The gases of combustion passing through the bags are drawn off and delivered into a stack. The contents of these bags is then sent to calcining furnaces, where the zinc-lead oxides are thoroughly roasted, giving a product which is creamy white in color and answers admirably for the body of the cheaper grades of paint. After the first roasting, the sintered ore left as a residue contains the gold, a large part of the silver, and the copper and iron contents. This is taken to matting furnaces, and the values collected in a copper matte, which, after fire concentration, is ready for treatment, to extract the copper, gold, and silver in metallic form.

EMPIRE ZINC WORKS.

At the Empire Company's works the ores are treated by crushing and concentrating on Wilfley tables, making an iron-zinc and a lead product. The iron-zinc concentrates are dried and passed over a Wetherall Magnetic Separator, cleaning the zinc sulphides from the iron in mechanical mixture, and the zinc product is then shipped to some one of the Empire Company's smelting plants in the East for treatment.

FLORENCE REDUCTION PLANTS.

At the town of Florence, in this county, the United States Reduction and Refining Company has a very large chlorination plant, treating the Cripple Creek ores by that method. The Union plant treated last year 128,500 tons of ore, having a value of $4,004,300.

There is also, at Florence, in successful operation the Dorcas Company's cyanide plant. In point of high extraction this plant can rank among the first, if it is not the first, in the State. Its work during the past year has been of very high character, especially when the fact is taken into consideration that all of the cyanide plants which went into the United States Reduction Company's combination have been closed down because the Cripple Creek ores have been considered too refractory to treat by the cyanide method. The record of the Dorcas Company is 26,148 tons treated during the year, of an average assay value of 1.22 ounces gold per ton. The actual saving was better than 93 per cent of the assay values, and it is the expectation to bring the extraction up to 95 per cent. All of the ore treated at the Dorcas mill is roasted before cyaniding, and everything is made mechanical and automatic as far as possible in the handling of the ore.

After cyaniding, the exhausted sands are conveyed to a series of Wilfley tables, which concentrate the tailings, saving any coarse gold which may have been in the pulp.

TO CYANIDE HIGH GRADES.

As an illustration that the cyaniding process is not confined to low-grade gold ores, Mr. Hower, manager of the Dorcas mill, stated that he had treated 10-ounce gold ore in their mill as successfully as the lower grades, and that during the coming year he expected to bid for the higher grades of ore from the Cripple Creek district.

GILPIN COUNTY.

The year has proved of increased activity in the mines and prospects of Gilpin County. Outlying districts have been brought into prominence by the discovery of important ore bodies, which will require new mills.

Contracts have been let for the construction of a railroad which will develop an immense area of rich mineral land in the northeastern part of the county. Heretofore this section has suffered because of its isolation, hauling charges to the mills being so excessive that nothing but the highest grade ore was shipped.

Smelter shipments show an increase for the year, proving larger ore bodies gained at greater depth. Stamp mills have worked to full capacity and several new ones have been added to meet the demand.

RUSSELL DISTRICT.

This section has shown unusual prosperity and activity, owing to the discovery of remarkably strong veins of pyritic ores, in some instances all the product being of smelting character.

The West Notaway Mine has produced steadily from its 300 and 360 foot levels. Concentrating and smelting ores have been of good values. A new find of yellow copper and peacock iron, 10 inches wide, yields good smelting returns. The 550-foot shaft is being unwatered to open up the lower levels.

The Saratoga has been one of the heaviest producers in the district, in tonnage as well as values. The shaft reached a depth of 1,000 feet where a crosscut opened up an immense vein of low-grade smelting ore, at its greatest width, over 26 feet. The Saratoga shipped about 75 tons daily to the Golden pyritic smelter and to the concentrators at Black Hawk.

TOWN TOPICS COMPANY.

The Town Topics Gold Mining Company is developing by means of three shafts. The deepest shaft is 600 feet and 7 levels are worked, all in good ore. The average smelting ore shipped during the year, it is claimed, ran $80.50 per ton, which is an unusually high average. The property is operated mainly by leasers.

The Cashier Gold Mining and Milling Company has a shaft 500 feet and will continue sinking. The shipments for the year have been large and of high grade.

The Old Town has shipped to Black Hawk mills an average of 40 tons per day. The shaft is down 800 feet, and is to be continued to 1,500 feet. The ore is chiefly concentrating.

The Specie Payment has been a large and steady producer to the mills and smelters. Many improvements have been made on the property.

The Fairfield shaft has reached a depth of 500 feet. At 350 feet a level was run encountering an ore body giving mill returns of one-half ounce and smelter ores from 6 to 8 ounces gold per ton. Few shipments have been made, as the work is mainly development.

The David Gold Mining Company has installed two new plants of machinery and sunk two shafts.

The Lotus has a shaft down 800 feet and is blocking out large amounts of low-grade concentrating ores.

The following producing mines are worked by shafts from 200 to 800 feet: Eldorado, Gem, East Notaway, Prompt Pay, Holland, Frontenac, Chase, Robert Fulton, Powers, Gold Rock, Hall, Hampton, Waltham, Golden Wedge, and Pewabie.

NEVADA DISTRICT.

The Delmonico shaft has reached a depth of 1,100 feet, over 600 being new development work. Gold values were found in the lead and yellow copper ores. Levels have been run every 100 feet.

The Alps is a steady producer of fair grade mill dirt, with smelting ore running about $100 per ton. Twenty-five men are employed on the property. The shaft is down about 1,300 feet.

The Kansas-Burroughs has shipped about 70 tons daily of low-grade mill and smelting ores. The mine is largely operated on the leasing system, and between 75 and 100 men are at work.

The Ophir-Burroughs ships about 25 tons per day of low-grade milling and a small quantity of high-grade smelting ore. Its shaft is 1,300 feet deep.

The Forks Extension installed a plant of machinery and has a shaft down 225 feet, producing a fair grade of ore in development work.

The Nevada Consolidated Gold Mining Company is operating the King shaft at 600 feet. The ore is principally of a lead character and carries fair values. The product is shipped to sampling works and concentrators.

The Mackay-Burroughs is a steady producer of fair-grade milling and smelting ores. Shaft is down 900 feet.

Among other shippers and active miners are the Pozo, Climax, Columbia, and San Juan.

LAKE DISTRICT.

In this locality much development is being done. The Justice has made a good showing. In sinking the shaft some very good grade of smelting ore was shipped.

The Clay County has made regular shipments.

The Hidee has opened up a fair grade of smelting ore; shaft is down 250 feet.

The Mingo has shaft 325 feet deep and some good ore in sight.

The Grace Darling is developing and has a shaft 160 feet deep with good indications of being a shipper.

GREGORY DISTRICT.

This section embraces Black Hawk and vicinity and is most convenient to mills and sampling works.

The principal steady producers are the Gregory-Buell, shaft 700 feet, milling and smelting ores; Chicago-Carr, 400-foot shaft, operated by leasers who shipped fair grade of smelting and milling ores.

The Boston and Denver Consolidated M. & M. Company embraces the Fisk, Minnie, Gregory, and Bobtail mines, all of which have been heavy producers.

The Gowers Mines Syndicate, Limited, has employed about 50 men daily on the Running Lode and have sunk a shaft 850 feet. The smelting ore runs from $100 to $200 per ton. The concentrating ores are of exceptionally good values, heavy in gray and yellow copper and lead.

The Colorado-Carr is operated by leasers employing about 30 men, with average shipments of 30 tons of fair-grade smelting and milling ore. The mine is connected with its own mill by 600 feet of tramway.

EUREKA DISTRICT.

The Gunnell is operated by two shafts, 1,200 and 1,300 feet deep and has a very complete plant of machinery. Ships about 75 tons daily of fair-grade milling and smelting ore.

The Newfoundland has an incline shaft 900 feet. At the 600-foot level a fine body of smelting ore was opened up, carrying values of 13 ounces gold to the ton and a fair grade of milling ore.

The Straub has a large vein of concentrating ore, carrying yellow copper and lead; average value, $40 to $50 per ton.

The Spur Daisy's surface ores are among the richest in the county, carrying gold values of 2 ounces to the ton, mill dirt, and from 12 to 14 ounces gold per ton, smelting ores.

The Bon Ton has installed a machinery plant, and has sunk shaft 250 feet; has shipped a lead smelting and concentrating ore, carrying yellow copper and some zinc.

INDEPENDENT DISTRICT.

The Perigo Mines Company, Limited, has produced steadily about 100 tons daily of low grade. The ore bodies are large, easily mined, and free milling. A 30-stamp, rapid-drop mill, with amalgamating tables is operated. Main tunnel is driven over 4,000 feet. The mine is operated mainly on tribute system, and from 50 to 60 men are employed.

The Gold Dirt mine is worked by leasers and ships about 20 tons daily to Perigo mill. The smelting ores are copper and iron and carry gold values from $40 to $45 per ton.

The Stewart has shaft down 200 feet, and is shipping to the mills at Black Hawk. It is a fine milling proposition, carrying from 4 to 7 ounces gold per ton.

The Ezra White is developing and putting up new machinery.

The Blue Grass, Lone Star, and Champion are developing and have good bodies of concentrating and smelting ores.

Mill.	Location	Number of stamps.
Eagle	Black Hawk	35
Climax	do	25
New York	do	70
Boston	do	80
Meade	do	40
Penn	do	50
Gilpin	do	50
Iron City	do	25
Polar Star	do	40
Fullerton	do	35
Rocky Mountain	do	25
Perigo	Gamble Gulch	35
Avon	Nevada Gulch	30
Bonanza	Chase Gulch	25
Peterson	Lump Gulch	15

Sampling works, W. J. Chamberlain & Co.

CLEAR CREEK COUNTY.

The general mining conditions of the county show the result of intelligent and energetic work, backed by capital.

Shaft mining is being largely superseded by tunnel development, thus saving the enormous expense of pumping and also greatly reducing cost of handling the ore.

There has been no material change in the character of the ores in the district. Concentrating and amalgamating mills continue treating the product.

The pyritic smelter at Golden was eminently successful in treating low grades, making a fair profit for the mines on ores not averaging $10 per ton.

There has been an increased use of water power throughout the county. Several large companies have constructed dams, put in machinery for generating electricity, and have greatly lessened the cost of operating and lighting the mines.

IDAHO SPRINGS DISTRICT.

Steady production from the mines and continuous work on the great tunnel enterprises have made this a most successful year in this district.

The Lucania tunnel is being driven in Bellevue Mountain, and has for its objective point Quartz Hill, in Gilpin County. This is the shortest bore possible, and opens up a rich mineralized section at great depth. The company owns about 120 acres, which lie mainly along the tunnel line.

NEWHOUSE TUNNEL.

The Newhouse tunnel was worked until August, when, owing to disagreement as to terms of transporting ores and draining properties ahead, work was suspended. The tunnel has successfully and cheaply transported the product of the Sun and Moon and the Gem Consolidated properties. It has double track, with electric motors, and is altogether finely equipped. Its present length is about 14,000 feet.

The Big Five tunnel is also penetrating Bellevue Mountain, and is in 1,300 feet. Water power was used during the year, but the company is now installing a complete plant of machinery to furnish power, light, and transportation. It owns many mining claims along the projected routes, and will cut well-known veins in its 5-mile bore to Nevadaville, Gilpin County.

MILL CAPACITY TAXED.

The capacity of the mills to handle the ores of this district has been severely taxed and, consequently, several companies contemplate the erection of new and larger plants. Many of the old mills have installed the latest improved machiney, making greater saving of the gold at less cost of treating.

The Specie Payment mines are located on Bellevue Mountain, its claims midway between the Big Five and Lucania tunnel lines. The smelting values run from $35 to $120, mill dirt from $15 to $25, and concentrates from $15 to $25 per ton. The company employs about 50 men.

The Seaton is being worked through Foxhall tunnel at a depth of 550 feet. The mine is well developed, and shipped about 25 tons per day of good grade smelting ore. The company intends to erect a complete power plant operated by water force of Clear Creek. About 30 miners are employed on the property.

SUN AND MOON AND GEM GROUPS.

The Sun and Moon has been a steady producer of about 50 tons daily of high-grade milling and smelting ore. An upraise of 1,600 feet from the Newhouse tunnel is being driven to connect with the upper workings. A daily force of 150 men is employed on the immense ore bodies. The compressors are run by electricity.

The Consolidated Gem mines comprise about 100 acres on Seaton Mountain, and are cut by the Newhouse tunnel. Immense ore bodies have been opened up by the tunnel and also by shafts. The company owns two mills and a finely equipped electric power and lighting plant.

Among other active properties are the Sylvania, Shafter, Tropic, Bullion King, Dove's Nest, and Knickerbocker.

GEORGETOWN AND EMPIRE DISTRICTS.

Throughout these camps great encouragement has been derived from the resumption of work on some of the long-idle properties. Formerly the workings were by shafts, which encountered large water bodies at depth, and also proved too expensive in hoisting ore and continuous pumping. By means of new capital many rich veins will be opened up in the great tunnel enterprises now underway.

The Aliunde has been a large shipper, notwithstanding the low price of silver, and has good ore bodies in sight.

The Seven-Thirty and Pelican-Dives produced some good ore, but have curtailed shipments and are now driving the Burleigh tunnel to cut the vein.

The Wisconsian produced a very high-grade ore and made considerable output.

The Centennial has encountered a large ore body, carrying good values in gold.

The Mendota has made fair shipments while doing a large amount of development work and has encountered a large body of lead ore.

Among the mines actively developing are Sporting Times, Comet, Capital Prize, Griffith, Santiago, Phillips, and Pacific.

The Kelley tunnel is making 200 feet a month and is in Democrat Mountain about 2,000 feet. It will soon reach the new Benton vein.

The Prudential tunnel is penetrating Republican Mountain and will open up many patented claims.

EMPIRE DISTRICT.

The heavy sulphide veins of this district have been well exploited during the year. The milling ore averages $15, while the smelting bodies run from 2 to 10 ounces gold per ton.

The Rising Sun group encountered a fine body of ore and the property is being systematically developed.

The Empire Tunnel Company embraces four good claims—Gold Dirt, Dunderberg, Pick, and Equator—and will do a large amount of development work by means of tunnel to cut the lodes.

The Pittsburg and Silver Mountain claims are being worked by leasers, who have a good body of milling and smelting ore.

The Cleopatra has a fine body of smelting and milling ore in sight, and recent purchasers of the property will develop.

OTHER SHIPPERS.

Among other properties shipping are Crown Prince, Republic, Rosecrans, Sacramento, Atlantic, Gold Fissure, Headlight, and Gold Bug.

The Brooklyn tunnel, a new enterprise, is destined to develop the rich ore bodies in Lincoln Mountain.

The Marshall-Russel tunnel has driven about 700 feet in Covode Mountain. The company owns about 60 claims and has a fine plant of machinery and valuable water rights.

YANKEE DISTRICT.

With comparatively little development this section shows a remarkable output of ore. The best returns are found at depth, and many new hoisting plants have been installed.

The Waugh process (a dry concentrating mill) has been so successful that the plant will be increased to a daily capacity of 50 tons.

The Lombard has been a steady shipper to smelters, the mill dirt being handled at its own mill. The property is worked by shafts with about 1,200 feet of tunnel levels.

YANKEE CONSOLIDATED.

The Yankee Consolidated embraces about 60 claims, 5 water rights, and 2 good mill sites. Its most important work is the Manhattan tunnel, which will be used for transportation and drainage by the many properties it will cut.

The Stonewall has produced a good grade of milling and smelting ore.

The Last Hope has a tunnel in about 500 feet and shows a good body of ore.

The Puritan tunnel is being driven to cut the rich ore bodies of the Puritan vein and has progressed about 500 feet.

The Niagara, Cumberland, Oro Verde, Shamrock, Chesapeake, Sierra Nevada, Milwaukee, Main, Surprise, and Alice mines have proved to be good shippers.

CHICAGO CREEK.

The Burns-Moore tunnel is progressing at the rate of 200 feet a month, is 9 by 9 feet in the clear, and finely timbered. The company owns nearly 40 claims.

The Big 40 tunnel is being driven about 6 feet a day, has penetrated about 300 feet, and already cut some good veins. This company owns about 50 claims, and, besides developing its own lodes, will afford transportation and drainage to some of the richest mines in the county.

The Little Mattie has a shaft about 700 feet deep. Eight levels have been run and five bodies of ore exposed. The property is equipped with complete plant of machinery, including a 60-stamp mill, and has abundant water power. Other producers are the Fraction, Quito, and Little Albert.

FREELAND DISTRICT.

The Coronation is running a tunnel in Donaldson Mountain to develop its numerous claims.

The Teller group has a shaft down 300 feet. The levels show good veins of lead ore with values running from $30 to $60 per ton in gold.

The Freeland, Gum Tree, and New Era are all developing.

MILLS.

	Tons.
Donaldson	60
Mixsell	30
Allan	50
Jackson	75
Golconda	10
Humboldt	10
Salisbury	60
Newton	110
Wilkie	40
Little Mattie	60
Silver Age	60
New Era	35
Smith	60
Standard	60
United Gold	25
Bertha	40
Idaho Springs M. and R. Company	125
Lincoln	30
Donaldson	60
Chamberlain-Dillingham Sampler	100

BOULDER COUNTY.

The general mining condition of the county has been prosperous.

The output of precious metals was normal, but with the vast amount of development work, extensive tunneling enterprises, additional mills, and the advent of a new railroad in the southwestern section, Boulder County bids fair in the coming year to eclipse all previous records.

WALL STREET DISTRICT.

The electro-chlorination mill of the Wall Street Gold Extraction Company was not completed during the year, which seriously handicapped the numerous low-grade producers of the district. The mill will have a capacity of 125 tons a day, with a treating charge of from $5 to $12 per ton.

The Black Swan mill, at Salina, treated ore from the Emancipation and other mines with satisfactory results.

The Wood Mountain mill, above Wall Street, worked steadily. It is to be increased to a daily capacity of 100 tons to handle the ore from the Zoppar vein. The Wood Mountain Mining Company is sinking a shaft which will be 1,200 feet below the crosscut tunnel level, with drifts 100 feet each way.

The Lucky Star shaft is down 400 feet and levels run. High-grade ore was encountered at the 250-foot level.

The Logan mine is being systematically developed, and the rich ore bodies in the upper tunnels have been duplicated in the Crœsus level, which is the lowest. This mine is one of the oldest as well as richest in the district.

The Nancy Gold Mine and Tunnel Company has a tunnel driven 1,200 feet. A large amount of ore is in sight and on the dump awaiting completion of the electro-chlorination mill. Leasers are doing well on the Tambourine and other properties.

GOLD HILL.

The Slide and Cold Stream mines are the principal producers and have shipped high-grade ore.

The White Cloud mine has installed new machinery.

WARD DISTRICT.

Considerable development work and improvements have characterized this district. The B. and M. has shipped some good ore. The

Morning Star has produced steadily and recently encountered a wonderfully rich vein of tellurium, which is unusual in this district. The Ward-Rose is producing ore carrying 3 to 4 ounces gold and running high in silver.

JAMESTOWN DISTRICT.

The Longfellow, formerly a low-grade producer, has a fine body of high-grade smelting ore. The vein is 30 inches wide and is an iron sulphide, carrying calaverite. The Wano is producing large bodies of low-grade sulphide ore. The Golden Age is being steadily worked by leasers, who are making good profits.

SUGAR LOAF DISTRICT.

The Livingston Gold Mining and Milling Company had the sensation of the year, having encountered immensely rich tellurium within a few inches of the surface, some of which ran $15 to the pound, in gold. The shaft is down 250 feet, showing an average vein 4 feet in width, carrying gold values of smelting ore of $40 and milling ore of $15 per ton. The company has a cyinide mill of 20-ton capacity, which has been run steadily.

Other shippers in the vicinity are the Trojan, Golden Age No. 2, Sparkling Jewel, and Golden Eagle.

MAGNOLIA.

More activity and development has been in progress in this district than ever before, with substantial results. Among the shippers of high-grade tellurium are the Cash, American, Kekiongah, and Graphic.

ARAPAHOE PEAK DISTRICT.

The Consolidated Copper Mining and Milling Company has a group of claims comprising about 300 acres. The company is developing, by means of shafts, from 10 to 350 feet in depth, and have discovered ore carrying good values in gold, silver, and copper. A complete plant of machinery was installed.

GRAND ISLAND DISTRICT.

This section has been unusually active during the year. Much foreign capital was invested in anticipation of the proximity of the new railroad. With the advent of railroad transportion within 4 miles, thousands of tons of low-grade ore, now in the mines or on the dumps, will show a good profit in the lessened cost of hauling to mills and smelters.

The Mogul tunnel has been pushed into Spencer Mountain and cut some rich ore bodies.

The Revenge Tunnel and Development Company has commenced work upon a 8 by 9 foot tunnel, which will penetrate Bryan Mountain 6,000 feet. It will cut more than 50 veins, already discovered, at a depth from 1,000 to 1,200 feet. The main object of the tunnel is to reach the rich ore deposits in the Maud W and Revenge claims at a greater depth. It will also be used as a transportation and drainage tunnel for other mines.

The Denver Tunnel Company is a new enterprise being driven into Chittenden Mountain. A complete plant of machinery has been ordered for the work.

Among the producers and shippers have been the Revenge, Enterprise, Boulder County, Sweet Home, Mineral Point, St. Louis, and Eagle Bird. Only the high-grade ore has been shipped, on account of long distance from mills and railroads.

ACTIVE MILLS.

The following mills were in active operation during the year:

Mill.	Daily capacity.
	Tons.
Black Swan, Salina, Cyanide	20
Livingston, Sunshine, Cyanide	20
Wood Mountain, Wall Street	20
New Century, Jamestown	50
Longfellow, Jamestown	20
Boston, Ward	50
Gold Nugget, Left Hand	20
Boulder County, Caribou	60
Gale, Rowena	60

MONTROSE COUNTY.

In the extreme western part of Montrose County, on La Salle Creek, and near the Utah boundary, a remarkable vein of copper was opened up several years ago. Its very high grade, both in copper and silver, caused excitement at the time. Some time ago a small matting furnace was erected, and during the past year the La Salle Copper Company has shipped out 20 tons of copper matte, averaging 70 per cent copper and 400 ounces silver to the ton. The furnace concentrated something like 20 tons of ore into one of matte. Some idea of the difficulties the plant encountered can be formed from the fact that the company had to build its own coke ovens at a point 18 miles distant from the furnace and mine its own coal. The iron ore used for flux was mined and shipped from Ophir, in San Miguel County, transported by rail to the town of Placerville, a distance of 19 miles, and then hauled in wagons a distance of 80 miles to the smelter.

Source of Production.

Gold:	
Placer bullion	$650,000
From chlorination mills	9,530,467
From cyanide mills	1,672,946
From dry and copper ores	12,497,381
From lead or wet ores	4,165,794
Total	28,516,588
Silver (coining value):	
From quartz	4,494,471
From lead and copper ores	15,935,051
Total	20,429,522

TOTAL PRODUCTION OF COLORADO, 1902.

County.	Gold.	Silver (coining value).	Total value.	Lead.	Copper.	Zinc.	Grand total.
Baca		$12	$12		$229		$241
Boulder	$524,252	106,606	630,858	$549	1,317		632,724
Clear Creek	931,671	1,649,996	2,581,667	133,588	56,282	$5,697	2,777,234
Chaffee	417,487	147,280	564,767	18,595	20,616	968	604,946
Costilla	558	200	758				758
Conejos	629	52	681		9		690
Custer	23,708	36,363	60,071	3,853	3,914	968	68,806
Dolores	47,462	156,492	203,951	15,824	1,788	86,998	308,564
Eagle	25,754	58,483	84,237	33,897	17,836		135,970
Fremont	144	32	176		2,649	484	3,309
Gilpin	1,550,971	391,986	1,942,957	20,243	90,944		2,054,144
Grand	880	5	885				885
Gunnison	103,544	158,848	262,392	29,668	3,408	4,840	300,308
Hinsdale	98,355	151,159	249,514	252,900	988	920	504,322
Huerfano	641	322	963				963
Jefferson					354		354
Lake	1,192,649	7,163,023	8,355,672	1,597,578	312,443	2,380,368	12,646,061
Larimer	488	11	499		2,957		3,456
La Plata	124,635	9,527	134,162	88	373		134,623
Mesa	111	3	114		1,782		1,896
Montrose	5,453	3,999	9,452	3	298		9,753
Mineral	113,913	2,486,008	2,599,921	378,692	23	37,955	3,016,591
Ouray	2,420,720	1,021,072	3,441,792	173,466	62,553		3,677,811
Park	147,807	79,031	226,838	26,888	964		254,690
Pitkin	2,830	3,951,852	3,954,682	1,016,434	1,267		4,972,383
Rio Grande	10,121	4,012	14,133	7	150		14,290
Routt	14,115	128	14,243				14,243
Saguache	2,437	13,526	15,963	18,518	1,624	8,088	44,193
San Juan	1,523,735	1,081,089	2,604,824	313,385	357,859		3,276,068
San Miguel	2,007,143	1,365,197	3,372,340	174,881	54,029		3,601,250
Summit	236,544	310,511	547,055	114,613	8,861	10,656	681,185
Teller	16,912,783	81,470	16,994,253	266			16,994,519
County unknown	75,048	1,227	76,275				76,275
Total	28,516,588	20,429,522	48,946,110	4,323,936	1,005,517	2,537,942	56,813,505

STATEMENT OF BULLION OPERATED ON AT UNITED STATES MINT, DENVER, COLO., DURING CALENDAR YEAR 1902.

County.	Gold.	Silver.	Total.
Boulder	$44,374.48	$302.01	$44,676.49
Clear Creek	14,888.76	126.82	15,015.58
Chaffee	43,177.56	150.60	43,328.16
Dolores	955.11	5.50	960.61
Eagle	165.09	.50	165.59
Gilpin	427,595.48	2,338.17	429,933.65
Gunnison	912.49	7.42	919.91
Lake	6,727.06	52.41	6,779.47
La Plata	655.30	3.18	658.48
Mesa	84.33	.55	84.88
Montrose	1,867.77	11.91	1,879.68
Ouray	1,563,776.86	17,020.34	1,580,797.20
Park	14,613.71	68.03	14,681.74
Pitkin	308.73	1.78	310.51
Routt	13,845.44	46.33	13,891.77
Saguache	305.39	1.84	307.23
San Juan	5,358.46	15.13	5,373.59
San Miguel	1,343,224.23	17,311.51	1,360,535.74
Summit	90,702.21	615.10	91,317.31
Teller	10,180,402.22	812.44	10,181,214.66
County unknown	116,343.59	798.36	117,141,95
Smelter deposits	1,592,369.52	1,034.24	1,593,403.76
Total	15,462,653.79	40,724.17	15.503,377.96

STATEMENT OF BULLION OPERATED ON AT UNITED STATES MINT, DENVER, COLO., DURING CALENDAR YEAR 1902—Continued.

FOREIGN TO COLORADO.

Source.	Gold.	Silver.	Total.
Alaska	$4,312.32	$16.85	$4,329.17
South Africa	124.30	.32	124.62
Arizona	532,304.71	6,598.65	538,903.36
Central America	125.54	2.07	127.61
California	1,553.48	20.39	1,573.87
Idaho	6,384.02	40.17	6,424.19
Mexico	11,760.52	118.18	11,878.70
Montana	580.41	4.94	585.35
New Mexico	108,673.09	404.76	109,077.85
Oregon	214.74	1.45	216.19
South Dakota	203.65	.89	204.54
Utah	76,364.32	711.50	77,075.82
Washington	559.06	2.70	561.76
Wyoming	5,629.42	14.12	5,643.54
Total	748,789.58	7,936.99	756,726.57

MISCELLANEOUS.

Classification.	Gold.	Silver.	Total.
Jewelery	$26,599.21	$190.30	$26,789.51
United States coins	223.46	....	223.46
Foreign coin	12.28	....	12.28
Redeposits	2,663.75	62.70	2,726.45
Total	29,498.70	253.00	29,751.70

RECAPITULATION.

Source.	Gold.	Silver.	Total.
Colorado	$15,462,653.79	$40,724.17	$15,503,377.96
Foreign to Colorado	748,789.58	7,936.99	756,726.57
Miscellaneous	29,498.70	253.00	29,751.70
Grand total	16,240,942.07	48,914.16	16,289,856.23

IDAHO.

By J. W. Cunningham,

Assayer in charge United States assay office, at Boise, Idaho.

Annual reports covering a period of years show a marked steadiness in the mineral output of the State, a steadiness not equaled in any other material production. There have been, to be sure, considerable fluctuations from year to year in the production of individual mines and of mining districts, but the gains and losses resulting from these fluctuations have so nearly balanced each other that when the reports from all over the State are brought together but little change appears in the total.

The year 1902 was noted for general activity in the mining industry throughout the State. Development work in the opening up of ledges has been carried on steadily, and mills and machinery have been added where the showings seemed to justify their purchase. As a result, several additions have been made to the list of producing mines.

Favorable reports are being received from the newly discovered districts, some of which have attracted attention throughout the country. These districts lie far back in the mountains and at present are inaccessible during half of the year, and the development of the mines will be slow, owing to the difficulty in transporting machinery and supplies.

The old placer districts continue to yield in amounts governed mainly by the amount of water supply. The supply was small and the season short in 1902, as a result of the light snowfall in the winter of 1901–2.

Dredges operated by steam or electric power, and, therefore, independent of the water supply, which is the sole reliance of the hydraulic miner, are working successfully in several of the old placer districts.

The production of gold in Idaho has not increased so rapidly as in many other States, but the prospect now is that there will be a pronounced revival in the industry in the immediate future and that this State will become one of the largest producers in the country.

In passing, it will be interesting to review past conditions, as these serve to show why it is that Idaho has been so backward in its gold-mining development. While the silver-mining industry of the State has attained very large proportions, gold mining has lagged behind for many years.

It is somewhat surprising to many inquirers to find that the State of Idaho has been so slow in the development of its gold resources. They know that the State, then a Territory, came into prominence as a producer of placer gold forty years ago. They also know that there was much lode mining in Idaho at that time and during a long period thereafter. It is therefore difficult for such persons to understand why it is that Idaho has not kept pace with some other States.

The placer gold discoveries during the pioneer days brought numbers of miners into this region. They were very rich and produced enormously for a number of years. In time, however, the richest placers were worked out. This left a vast army of miners to drift elsewhere. These scoured the mountains and valleys of Idaho searching for placers and lodes, and eventually took their departure. In the minds of all such persons leaving the State there was little or no doubt that the mines had been exhausted. They did not expect to see important mining developments in the future, and they did not hesitate to spread that impression among mining men in all parts of the country where they appeared.

While the placer mining work was going on many lode mining discoveries were made, and these were worked with a great deal of vigor. It developed, however, that the veins were free milling only near the surface where the ore had been oxidized. When development had penetrated into those portions of the leads that had not been changed by the action of the air the ore taken out could no longer be worked by the processes that were then employed. Methods of handling base ores economically had not been discovered. It was impossible to transport ores to distant markets, and consequently a great many such mines had to be closed down. This added to the widespread impression that Idaho had nothing to offer in a mining way.

Again, the State has been seriously deficient in railway transportation facilities. Such lines as existed within its borders were generally constructed solely with the view of finding the shortest and most available route to points on the coast. These lines were not built through sections that were capable of much mining development; nor have the companies constructed many feeders into the mining sections. Idaho is a very large State and a great portion of it is almost unexplored. Much of the unexplored region shows indications of being rich in the precious metals, but those sections have been so far removed from railway points that there was little or no encouragement for prospectors to go into them for the purpose of developing the leads. Under all these conditions mining development in Idaho has been backward. The attention of miners has been drawn to other sections where better facilities were afforded and which were more diligently brought to the attention of the public. Though the gold-bearing area of this State is greater probably than that of any other of the Union, other States have been developed while Idaho has remained practically a virgin field to be explored by a later generation of operators.

The State, however, is now drawing to itself a much larger measure of attention than ever before, and there is much reason to believe that some of the most interesting mining developments of future years will be recorded here. The work that has been done during the past two or three years has sufficed to demonstrate the fact that gold is very widely distributed in paying quantities throughout these mountains, and it is the confident belief of those best qualified to judge of such matters that the future will witness a pronounced revival of gold mining in Idaho, and that the State will take a very high place for its production of that metal.

THUNDER MOUNTAIN.

Undoubtedly the chief feature in attracting increased attention to Idaho has been the wide publicity given to the Thunder Mountain section. That is one of the most interesting mining localities that the

State has, and there are many reasons supporting the belief of those who hold that it will fully bear out all the early predictions respecting its wealth. At any rate the discoveries that were made in that section were of such a character that they aroused public interest. The interest thus excited has benefited all sections of the State, and the opening of a number of new districts is directly traceable to this Thunder Mountain movement. Not only have other new districts been found but capital has come forward, prepared to take hold of properties that were worked in the early days and that were abandoned because of the baseness of the ore encountered when deep mining was undertaken.

Thunder Mountain is in a most inaccessible location. Broadly speaking, it is that section of country east of the Middle Fork of the Salmon River that is drained by Big Creek. More specifically it is a portion of the region drained by Monumental Creek, a tributary of Big Creek. It was on Mule Creek, which flows into Monumental, near the head of the latter stream, that the original Thunder Mountain discovery was made. That discovery was on what is known as the Dewey property. It is a somewhat singular fact that, though it is a lode mining claim, the discoverers worked it for a number of years as a placer, not realizing the character of the deposit they had met with. Annually those men marketed gold taken from the surface of the ground during the short season in the spring, while the melting snow gave them a supply of water with which to work.

In 1900 the property attracted the attention of persons who realized that it was a lode mine of very interesting possibilities. They secured a bond on it and set about its development. While that development was in progress the original owners, under the terms of the agreement of sale, continued the placer-mining operations on the surface, and in the spring of 1901 they uncovered a remarkable body of very rich quartz. It was this discovery that attracted the boom which was at its height in the winter of 1901 and 1902.

During the succeeding year there was very little development of mines in the district. Prospectors were looking everywhere for such pockets of gold as had been found on the surface of the Dewey. Moreover, it was the general belief that the entire mass of many large porphyry dikes was gold-bearing ore. These dikes were found in every direction and the country was covered with mining claims for miles.

During the year 1902, however, several companies that had secured property in the district set about its exploration. These kept men at work during the past winter, and in a number of instances very important results have followed. The Dewey mine has been shown to carry a large vein of ore that will bear treatment. While statements as to its value vary widely, there seems to be no doubt that the mine will prove highly profitable. Similar developments have occurred on the Sunnyside property, and at several other points ores of the same general character have been disclosed. Altogether, the developments have been so encouraging that all the companies interested there are arranging to prosecute work without interruption, and some are arranging for large milling plants. A small mill of 10 stamps has been at work on the Dewey. It is to be increased to 50 stamps, possibly 100, during the present season, and the owners of the Sunnyside have a 40-stamp plant on the way to that property. Several smaller mills, it is said, have been arranged for by other corporations.

This machinery can not reach the mine until a wagon road 70 miles long shall have been completed. The State legislature at its last session made an appropriation of $20,000 for this road. The amount was duplicated by owners of Thunder Mountain property, and the road is now being constructed with a prospect that it will be completed by October.

OTHER DEVELOPMENTS.

Prospectors attracted to the Thunder Mountain country expended the known limits of the mineral-bearing district by exploration of the country tributary to Big Creek. That region is of an entirely different character from Thunder Mountain proper. Its veins are well-defined fissures, such as are familiar to prospectors in all lands.

They are, however, of phenomenal proportions. It has been stated by many mining men qualified to express an opinion on the subject that there is no other section of country with such extensive mineral indications. The veins are not only very large, but are numerous and appear to be mineralized throughout their entire width. In some instances the outcroppings of these ledges have been found to be fully 300 feet in width. A large number of these veins have passed into the control of Eastern people by whom they are being developed. It is still too early to venture a prediction respecting their future, but it seems altogether probable that a number of very important mines will be opened in that section.

It will be impracticable, however, for these Big Creek mines to become large producers until better transportation facilities are afforded. There may be some exceptions—possibly some of them will be found to be largely free-milling—but in most instances the ores appear to be base, and it is not likely that the concentrates will be sufficiently high grade to bear wagon transportation to present railway points. Possibly some of the product will yield to the cyanide process, but as a rule the ores do not seem of the kind amenable to that method of treatment.

It is an interesting fact, however, that the railway people are attracted by the possibilities of large tonnage afforded by these veins and are now engaged in surveying a line of railway to reach that section. The road, as proposed, will pass through Custer and Lemhi counties and down the Middle Fork of the Salmon.

BOISE GOLD BELT.

One of the most interesting developments of recent years has been on what is designated as the Boise gold belt. This is a mineralized zone reaching from Neal to Pearl and passing through the foothills within a few miles of the capital city. It was not supposed, until recently, that valuable ore deposits existed so near Boise, but it has now been demonstrated that portions of that belt are of very great importance. This is particularly true of Pearl, northwest of Boise. In that district a number of valuable properties have been opened up, and the indications are that it will become the scene of great activity in the future. The lands upon which the mines were discovered there were formerly used as pasture for sheep and it was thought very absurd when it was first announced that gold had been discovered in such a section. Work has been going on for several years and the district has now attained such importance that numbers of mining men are securing property for the purpose of development.

In a recent article on Pearl, which is also known as the Westview mining district, Hon. Robert Bell, State mine inspector, makes some very interesting statements, some of which are as follows:

> Commencing at the Lincoln mine, the mineral-bearing zone extends almost due northeast for 7 miles to the United mines and Osborne group, right down on the bank of the Payette River, and is fully a mile and a half wide. This entire belt is blocked out solidly with continuous locations, and it is safe to say that every location covers a fissure vein and some of them a series of veins, containing more or less gold-bearing ore.
>
> Bearing on the probable permanency of the veins and their values with depth, in this district there are numerous physical features that are quite conclusively in its favor. The most conspicuous of these are the results obtained by the development of the Checkmate mine, which is now explored to a depth of 500 feet on the dip of the vein, and it is a matter of record that every succeeding level developed in this mine has shown a gradually expanding volume of ore, and every succeeding year of its operation has shown a steadily increasing value of gold bullion produced—a most encouraging result, to say the least.
>
> The sum of the practical mining experience of all the world is that the richest and best ore bodies are found in regions of deep fissures and are almost invariably associated with an excessive development of igneous dike rock. In this respect, then, the Westview district, with its great veins and dike systems, is especially well supplied with the ideal conditions necessary for the development of extensive and profitable mines, and given the same formations and ore combinations that have proven so immensely profitable in other fields, I see no reason to doubt that like results may be anticipated here.

OWYHEE.

The Owyhee section has been famous since the early days of Idaho as a producer of gold. It first came into prominence as a rich placer district. Later the lode mines, situated on War Eagle Mountain, produced great quantities of gold, and the district was one of the most prosperous in the West. As depth was gained it became increasingly costly to operate these mines and they were finally closed through financial difficulties of their owners occasioned by the failure of the Bank of California. Two years ago a tunnel was started to open the ledges at a depth considerably greater than the old workings had reached. This tunnel is some 2,100 feet beneath the comb of the mountain and 700 feet under the old workings. Work on the tunnel has been suspended for some time, but it is understood it will soon be resumed. That is a very important project, because if the ore shoots should be found as rich as they were above, these mines would add largely to the production of the State.

COEUR D'ALENE.

The mining district of Idaho that always holds a large place in the eye of the mining world and that always contributes very largely to the production of the State, is that section known as the Coeur d'Alene. The principal mines there produce lead and silver. Their output during the past year was very large, production being maintained on a basis of the best of past records. An important feature of those mines is that they are thoroughly dependable. There is no variation as depth is gained upon the veins. Year after year the companies have gone deeper and deeper into the bowels of the earth, but the ore shoots are always found unchanged, and thus those properties continue to make records of production that entitle them to stand forth in the front rank among the mines of the West. The ores of the lead-silver mines are all treated by concentration, the concentrates being shipped to smelters at outside points. During the past year a very important project has been launched which has in view a lowering of cost for power for the operation of the mines and mills of that section. Steam plants are to give place to electricity in many instances, the power being brought from Spokane. Though there is abundance of water power in the immediate vicinity, it has been deemed more desirable to build a long transmission line and utilize power generated at the falls of the Spokane River. The plant at the latter point is very large, furnishing electrical energy for the city of Spokane and much of the surrounding country; consequently the company controlling it is in a position to furnish the Coeur d'Alene mines with power under conditions that could not be duplicated by a local plant.

OLD DISTRICTS.

It is a very interesting and important fact that many of the old districts in the State are again showing signs of activity. In numerous instances properties that have long been closed down are again being worked, and, generally, with gratifying results. This is true of the Atlanta district, in Elmore County. In the early days of Idaho mining this was one of the important centers of the industry. It became impracticable, however, to work the ores that were mined at depth, and the mines were all closed down, remaining so for years.

With improved facilities it is now possible to treat those ores, and mining investors are taking hold of the properties with the view of opening them up extensively. In Rocky Bar, in Elmore County, there is a similar movement. That section produced heavily thirty years ago, but has been inactive during recent years. Some of the old mines there are about to be started up again, and there is reason to believe that the camp will once more be very active. In Lemhi County there are numerous old mining camps, all of which appear to share the revival that is in progress throughout the State. The same is true of Custer County. The latter has a number of mines that have been regular producers for a number of years, but there are several other districts that have been lying dormant. These all show indications of revival, and the probabilities are that the mining interests of that county will become much more important in the near future than they ever were in the past. Similar conditions are met with in Blaine County, in Washington County, in Idaho County, and in Boise County.

SALMON RIVER.

The great section drained by the Salmon River is practically all gold bearing, and a very large proportion of it is yet unexplored further than by such cursory examination as has been made by prospectors passing through in search of rich placer ground. The stream rises in the mountains of Custer and Lemhi counties, flows northward to the north end of the latter and then turns westward across the State.

Gold is found on all the tributaries in the two counties named, and many valuable quartz properties have been opened. Some of these were discovered years ago and are in the list of old properties now being reopened. Many leads have been discovered since the inauguration of the new era of prospecting following the discovery of Thunder Mountain. Probably the most important of these new discoveries are those on Loon Creek. In the early days rich placer mines were worked there, and last year the lode from which the gold probably came was discovered. The ore is very rich, much of it carrying values as high as $200 a ton, and the deposits appear to be large.

The mines at all points in Lemhi are giving great promise and the prospect is that that section will be found well in the front with respect to production of gold hereafter. The same is true of Custer County, though there is not so much newly discovered mining territory in that section.

Crossing the State the Salmon passes through a succession of canyons. The affluent streams generally come in through similar canyons. These conditions have made the exploration of that region very difficult, but much progress has been made, particularly since the discovery of Thunder Mountain, and a number of promising discoveries have been reported from the mountains in which those streams take their rise.

At the old camp of Warren, near the western border of the State, there has been small production for years, but now there is much greater activity. At other points in that section discoveries have been made, notably at Marshall Lake, and the development in all that region is likely to be interesting. On the north side of the Salmon the old placer camp of Florence is again attracting attention, both for hitherto unworked gravel deposits and for lode mines that are being opened. Black Lake district, in Washington County, and Rapid River, in Idaho County, are in the Salmon River region, and both are important.

At Black Lake, a large plant has been erected during the past two years, employing the cyanide process, and it has now begun the production of bullion. On the Snake River, above its junction with the Salmon, and some 75 miles from Lewiston, a copper region, known as the Imnaha district, is being developed. A steamboat with high power engines has been put on to carry supplies to that district from Lewiston and transport ores to that place.

CLEARWATER RIVER.

Another great stream that flows through a large section of Idaho that is almost unexplored is the Clearwater. It rises in the Bitter Root Mountains and flows westward through the State to a junction with the Snake at Lewiston. There is little known of the region where the river rises, but it is believed to be well mineralized. Farther along on its course, the river passes through a country that has been proved to be very rich in gold. That section was scoured for placer gold in the early history of the State, and at many points the miners met with exceedingly rich rewards. Pierce City is one of the sections that yielded rich harvests to those pioneer miners. Its placers are still being worked, large areas of lean ground having been left by the miners of the past generation because they would not pay at that time; but in that section important lode mines are now being developed. Some of these have become very profitable, and each season adds to the number of promising mines. Pierce is the center of a very large gold-bearing section, embracing a number of districts, and the developments in progress give promise of there being many very valuable mines in addition to those already opened.

One of the most important districts of that portion of the State is Buffalo Hump. It is one of the new districts, having been discovered only a few years ago. The district has passed through an experience that is common with nearly all new mining sections. Promising discoveries led to a stampede, during which the district enjoyed a great deal of notoriety. Then came a reaction. The throngs that rushed in, expecting to gather a fortune, quickly receded, and for a time the district attracted but little attention. But practical men who had secured a foothold went to work to develop their holdings, and now the district is beginning to produce considerably. Mines that started with small plants are enlarging their capacity, and the outlook is that the Hump, as it is designated, will become a permanent camp of more than average importance.

SNAKE RIVER.

The possibilities of placer mining along the Snake River, throughout nearly its entire course in the State, have always been most alluring. Immense areas of gravel are found to be liberally sprinkled with flour gold that is very difficult to save. It has often been estimated that these gravels carry enough of the precious metal to pay the national debt, but those who have endeavored to mine the ground on a large scale have failed. While men make good wages at many points in working with rockers and other small apparatus, numerous extensive plants erected at different times have been abandoned because the gold could not be saved when worked under such conditions. There have been a few exceptions, but the rule has been as stated. This year a new pattern of dredge is being erected on the river, and those interested in it claim that it certainly will save all the gold carried by the sand. That has been claimed for every other dredge, but the public is always glad to believe that the next one will accomplish what it aims at. In this latest enterprise there are some features entirely new, which seem to have interesting possibilities. Should it prove that the problem of saving such gold has been solved, the shores of the Snake will hereafter contribute much to the aggregate production of the State.

SUMMARY.

From reports received from mine owners and operators and from estimates made in cases where accurate information was unobtainable, I am able to submit the following figures, representing the mineral output of Idaho for the year 1902:

PRODUCT OF GOLD AND SILVER IN IDAHO, BY COUNTIES, DURING CALENDAR YEAR 1902.

County.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Coining value.	
	Fine ounces.		*Fine ounces.*		
Ada	715	$14,780	297	$384	$15,164
Bannock	631	13,044	101	131	13,175
Bingham	579	11,969	79	102	12,071
Blaine	725	14,987	110,544	142,926	157,913
Boise	16,481	340,692	4,770	6,167	346,859
Canyon	255	5,271	73	94	5,365
Cassia	1,890	39,070	170	220	39,290
Custer	668	13,809	85,545	110,603	124,412
Elmore	4,100	84,755	1,844	2,384	87,139
Idaho	7,596	157,023	3,464	4,479	161,502
Lemhi	10,787	222,987	2,844	3,677	226,664
Lincoln	1,850	38,243	214	277	38,520
Oneida	730	15,090	147	190	15,280
Owyhee	20,938	432,827	698,574	903,207	1,336,034
Shoshone	4,761	98,419	5,033,928	6,508,513	6,606,932
Washington	341	7,049	120	155	7,204
Total	73,047	1,510,015	5,942,714	7,683,509	9,193,524

TOTAL PRODUCT OF IDAHO DURING CALENDAR YEAR 1902.

Metal.	Quantity.	Value.
Gold .... fine ounces..	73,047	$1,510,015
Silver .... do....	5,942,714	7,683,509
Lead .... pounds..	128,606,458	5,787,290
Total value	....	14,980,814

DISTRIBUTION OF THE GOLD AND SILVER PRODUCT OF IDAHO FOR THE CALENDAR YEAR 1902 AS TO SOURCES OF PRODUCTION.

	Fine ounces.
Gold:	
Quartz	38,500
Placer	34,547
Silver:	
Lead ores	5,228,928
Quartz	713,786

GOLD AND SILVER PRODUCED IN IDAHO DEPOSITED WITH GOVERNMENT INSTITUTIONS DURING THE CALENDAR YEAR 1902.

Mints and assay offices.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Value.	
Mints:					
San Francisco	622.282	$11,577.34	154.14	$179.36	$11,756.70
Philadelphia	693.535	12,902.98	465.80	542.02	13,445.00
Denver	343.141	6,384.02	87.36	101.65	6,485.67
Assay offices:					
Boise	42,727.803	794,935.87	18,673.72	21,729.42	816,665.29
Helena	8,920.385	165,960.65	2,353.04	2,738.08	168,698.73
New York	34.782	647.10	20.88	24.30	671.40
Seattle	807.509	15,023.42	238.38	277.39	15,300.81
Total	54,149.437	1,007,431.38	21,993.32	25,592.22	1,033,023.60

SOURCES OF THE DEPOSITS AT THE UNITED STATES ASSAY OFFICE, BOISE, IDAHO, FOR THE CALENDAR YEAR 1902.

County.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Value.	
Ada	240.468	$4,473.82	72.84	$84.76	$4,558.58
Bannock	378.379	7,039.61	53.63	62.40	7,102.01
Bingham	235.241	4,376.58	24.13	28.08	4,404.66
Blaine	119.123	2,216.24	26.34	30.65	2,246.89
Boise	11,226.925	208,873.02	3,018.22	3,512.11	212,385.13
Canyon	132.524	2,465.56	31.92	37.15	2,502.71
Cassia	1,580.476	29,404.20	93.82	109.17	29,513.37
Custer	352.251	6,553.51	190.67	221.87	6,775.38
Elmore	2,554.978	47,534.48	1,095.07	1,274.26	48,808.74
Idaho	4,346.140	80,858.42	1,263.89	1,470.71	82,329.13
Lemhi	2,265.485	42,148.56	491.07	571.43	42,719.99
Lincoln	1,524.794	28,368.26	163.58	190.35	28,558.61
Oneida	579.776	10,786.53	84.11	97.87	10,884.40
Owyhee	14,313.976	266,306.53	11,129.96	12,951.23	279.257.76
Shoshone	2,747.086	51,108.58	868.81	1,010.98	52,119.56
Washington	130.181	2,421.97	65.66	76.40	2,498.37
Total	42,727.803	794,935.87	18,673.72	21.729.42	816,665.29
Montana	7,057.728	131,306.56	1,991.75	2,317.67	133,624.23
Oregon	29,137.986	542,102.08	9,392.16	10,929.06	553,031.14
Utah	10.449	194.39	2.21	2.57	196.96
Washington	156.991	2,920.76	24.61	28.64	2,949.40
Total	79,090.957	1,471,459.66	30,084.45	35,007.36	1,506,467.02

MONTANA.

By B. H. Tatem,

Assayer in charge United States assay office, Helena, Mont.

The value of the precious metals won by the washing, milling, and smelting of gravel and ore mined in the State of Montana during the calendar year 1902 was as shown in the table below, the gold and silver being computed at their coinage rate and the copper and lead at the year's average price:

Description.	Quantity.	Value.
Gold .... fine ounces..	212,854.623	$4,400,095.56
Silver (coining rate) .... do....	13,629,736.80	17,622,285.96
Copper (fine pounds, at $11.626 per hundredweight)	211,646,640	24,606,038.37
Lead (fine pounds, at $4.069 per hundredweight)	8,177,629	332,747.72
Total	....	46,961,167.61

These metals and their values, compared with corresponding data for the previous year, show the following changes:

Metals.	1901.		1902.		Decrease.
	Quantity.	Value.	Quantity.	Value.	
Gold .... fine ounces..	232,331	$4,802,717	212,854	$4,400,095	$402,622
Silver (coining rate) .... do....	14,180,545	18,334,442	13,629,737	17,622,286	712,156
Copper .... fine pounds..	228,031,503	36,751,837	211,646,640	24,606,038	12,145,799
Lead .... fine pounds..	11,504,892	498,622	8,177,629	332,748	165,874
Total	....	60,387,618	....	46,961,167	13,426,451

From the above table will be noted a decreased production of all the precious metals for the year. The low market prices paid for copper and lead during the year shows a decrease in the value of the production of these metals of $12,000,000. The average price of copper for the year 1901 was $16.117 per hundredweight and for the year 1902 $11.626 per hundredweight. The average price of lead for the calendar year 1901 was $4.334 and for the year 1902 $4.069 per hundredweight. The price for copper above quoted is for electrolytic copper. The Montana product is of this kind.

The decrease in the value of the entire metal production of the State for the year, compared with the same figures for 1901, copper and lead being figured at the average prices for each respective year, is about 22 per cent.

The State of Montana is rightly classed as a most important metal-producing region of the United State. The enormous amounts of metals mined during the year and the large amount of development work being done on new and promising properties of the State warrant the hope of an increased production for the future, in keeping with the general progressive tendency that now characterizes the world's important metal-producing countries.

Production of Gold and Silver in Montana during the Calendar Year 1902.

SUMMARY BY COUNTIES.

Counties, etc.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Beaverhead	4,915.857	$101,619.78	174,482.14	$225,593.08	$327,212.86
Broadwater	4,115.218	85,069.11	70,190.03	90,750.74	175,819.85
Cascade	502.287	10,383.19	248,941.90	321,864.28	332,247.47
Choteau	203.583	4,208.43	560.10	724.17	4,932.60
Deerlodge	921.843	19,056.19	20,112.00	26,003.39	45,059.58
Fergus	40,410.843	835,366.27	13,585.68	17,565.32	852,931.59
Flathead	3,418.614	70,669.02	100,312.14	129,696.50	200,365.52
Granite	7,338.375	151,697.67	832,388.22	1,076.219.12	1,227,916.79
Jefferson	3,281.429	67,833.15	468,279.40	605,452.14	673,285.29
Lewis and Clarke	37,092.580	766,771.68	111,903.51	144,683.32	911,455.00
Madison	32,748.130	676,963.93	127,372.14	164,683.18	841,647.11
Meagher	252.765	5,225.12	100,059.38	129,369.70	134,594.82
Missoula	3,754.987	77,622.47	1,105.30	1,429.08	79,051.55
Park	13,749.458	284,226.52	4,066.24	5,257.36	289,483.88
Powell	5,798.486	119,865.34	40,496.60	52,359.24	172,224.58
Ravalli	1,173.678	24,262.07	177.57	229.58	24,491.65
Silverbow	46,051.705	951,973.23	10,106,884.70	13,067,487.29	14,019,460.52
Sweet Grass	32.818	678.42	7.91	10.23	688.65
Returns from custom smelters, mints, and assay offices, impossible to classify by counties	7,091.967	146,603.97	1,208,811.84	1,562,908.24	1,709,512.21
Total	212,854.623	4,400,095.56	13,629,736.80	17,622,285.96	22,022,381.52

The amounts of gold originating from placers, mills, and cyanide plants of the State, and from copper, lead, and smelting ores, during the year 1902, compared with those of the previous year, were as follows:

GOLD.

Classification.	1901.		1902.		Increase(+), or decrease(−).
	Fine ounces.	Value.	Fine ounces.	Value.	
Placer dust	25,285.602	$522,699.78	21,625.833	$447,045.65	−$75,654.13
Mill bullion	72,961.647	1,508,251.10	50,402.081	1,041,903.46	−466,347.64
Cyanide bullion	57,013.558	1,178,574.84	62,458.742	1,291,136.79	+112,561.95
From copper ores	45,850.574	947,815.48	52,304.118	1,081,222.08	+133,406.60
From lead ores	6,479.641	133,946.07	4,360.347	90,136.37	− 43,809.70
From smelting ores	24,740.432	511,430.12	21,703.502	448,651.21	− 62,778.91
Total	232,331.454	4,802,717.39	212,854.623	4,400,095.56	−402,621.83

From the above comparative table it will be noted that the most attractive features in the production of gold during the year 1902 in Montana was furnished in the mining of copper ores and in the results achieved by the cyanide process. Since the employment of the cyanide process in the winning of gold from tailings and low-grade ores on a profitable basis in Montana the annual returns from this source have each year shown a substantial increase over each preceding year until it now reaches the large figure given above. For the benefit of those conversant with mining methods, would say that cyaniding is a chemical process, and is based upon the fact that a weak solution of potassium cyanide will dissolve the gold out of many quartz formations that contain it, and will do its work particularly well on iron pyrites, which is by far the most abundant auriferous mineral. Previous roasting of the ore is usually performed, though not always necessary. The operation is accomplished in great tanks, and after the solution has been in contact with the ore for the proper length of time it is filtered away into other receptacles, where the metal is precipitated and caught as in the case of chlorination. The cost of these chemical processes varies from $1 to $2.50 or more per ton, according to conditions. Perhaps the finest example of a cyanide plant in the West is at Mercur, Utah. Various other modern plants are situated at Kendall and Marysville, Mont. The cyanide process has registered a very remarkable success in gold metallurgy. The number of plants has steadily increased during late years, and in many instances the process is being used without previous amalgamation. It is not likely that this ratio of growth will be continued in the immediate future, but it is safe to predict that the creditable production already achieved will be maintained, and that eventually a greater and more profitable field for cyanide in the winning of gold will be opened in Montana.

The gold taken from the copper ores, almost all of which comes from Silver Bow County, shows an increase for the year 1902. The amount of this ore mined was less this year than for several years past, but the gold values in the ore have increased.

The diminished yield of gold in some of the classes of ore noted above are explainable in various ways. The decrease in the amount of gold won from the placers has been a small but constant one for some years. There are extensive deposits of auriferous gravel, upon which large operations are contemplated, but these can only be brought to profitable operation by the expenditure of considerable sums of money under intelligent and efficient direction—for ditches, flumes, drains, and machinery.

The decreased output of gold shown for mills was distributed throughout the State, more principally in Lewis and Clarke County. In this locality some of the mills were idle during the year, while others were not worked at full capacity and were partially closed down for various causes and periods. In some instances the cyanide process is replacing the stamp-mill and amalgamation process. The smaller tonnages of this class of ores mined also explains the decrease in the amount of precious metals recovered from this source.

The mining of lead in the State during the year was of minor importance, the market price for this metal being low throughout the year. The principal centers of production of this metal in Montana being in the counties of Beaverhead, Broadwater, Cascade, Flathead, Meagher, and Silverbow.

The cessation of work at the large smelter at East Helena during the months of May and June of this year, on account of differences between the employees and the smelting company, also partially explains the lessened production.

The amounts of silver for the years 1901 and 1902 that originated in the various classes of the metal product were as follows:

SILVER.

Classification.	1901.		1902.		Increase (+) or decrease (−).
	Fine ounces.	Coining value.	Fine ounces.	Coining value.	
Placer dust	2,730.78	$3,530,70	2,416.66	$3,124.59	− $406.11
Mill bullion	2,042,990.48	2,641,442.24	1,130,831.30	1,462,083.62	−1,179,358.62
Cyanides	126.492.27	163,545.56	166,088.00	214,740.04	+ 51,194.48
In copper ores	10,136,892.57	13,106,285.34	9,058,715.00	11,712,279.26	−1,394,006.08
In lead ores	397,029.03	513,330.47	410.737.51	531,054.56	+ 18,724.09
In smelting ores	1,474,410.06	1,906,307.95	2,860,948.33	3,699,003.89	+1,792,695.94
Total	14,180,515.19	18,334,442.26	13,629,736.80	17,622,285.96	− 712,156.30

This table shows a decrease in the output of silver for the year, and is explained as follows: The amount won in placer working is of no importance, being small at best, and varying annually with the gold from the same source. The decrease in the amount of silver credited as a product of milling ores was due to a lessened output of this class of ore by the mines of the State, and is explained in the same manner as the decrease shown for gold. The improvement in the amounts taken from the product of cyanide mills has the same explanation as that already set forth for the increases of gold from the same source.

The small increase in the amount recovered from lead ores is unimportant.

The mining and smelting of the copper ores of the State is still the most important and valuable feature of the metal mining industry. The city of Butte, the center of this production, continues to be the scene of great commercial and industrial activity. Its production of this metal is the greatest of any region in the world, about one-fourth of the world's supply of copper coming therefrom. The previous large number of employees underground at Butte and in the smelters at Butte, Anaconda, and Great Falls was maintained throughout the year, while the tonnages of the railroads in coal and incoming supplies and in the copper matte outgoing were enormous. The complicated litigation which has vexed the mines of the Butte district for several years past is still unsettled. The sale of the Colusa-Parrot mine and adjoining claims overlying the dip of the Neversweat and Anaconda claims at Butte, Mont., to the Amalgamated Copper Company, in March of this year, marked the end of important, bitter, and expensive mining litigation between these companies.

During the year 1902 there has been a noticeable increased activity in the development of the mining resources of the State. This has been felt primarily in the development of the gold deposits as a result of the success of the cyanide operations in the Judith district of Fergus County. The Kendall, Barnes-King, Gold Reef, New Year, and other cyanide properties have greatly increased the output of gold from this region.

The Anaconda Copper Mining Company's new reduction works at Anaconda, Mont., were completed early in the year and opened for the reduction of the ores from the Butte district. The plant throughout is equipped with the latest improved machinery and labor-saving devices. This plant has been in course of construction for about two years. It comprises nine separate departments or buildings, as follows: Concentrator department with ore and storage bins, concentrator boiler and power house, sampling mill department, roaster department, reverberatory department, blast furnace department, converter department, smelter, power and boiler house, and briquetting department.

Extensive improvements were also made on the plants of the American Smelting and Refining Company, at East Helena, also at the Boston and Montana Smelting plant, at Great Falls, Mont.

A new 60-stamp mill was completed and put into commission by the Big Indian Mining Company, of Jefferson County, in October of this year. The power for this mill is furnished by the Missouri River Power Company, from their 50,000 volt transmission plant, located on the Missouri River, at Canyon Ferry, some 20 miles east of Helena.

Power from this plant is also transmitted to the smelting plant of the American Smelting and Refining Company, at East Helena, and also to some of the large mining and smelting companies located at Butte, Mont., a distance of about 70 miles.

The Elkhorn Silver Mining Company is again in operation, after an idleness of some years. This is one of the famous silver producers of Jefferson County.

The county of Flathead, situated in the northwestern part of the State, showed remarkable mining activity during the year, and promises to be a large silver-lead producer in the near future.

The Cable mine, in Powell County, formerly one of the important and rich mines of the State, has been unwatered and is again taking its place among the producers.

Extensive improvements have also been made by the Granite Bimetallic Mining Company, of Phillipsburg, Mont. This company has acquired the Hope mine, a large silver property, also located in Granite County. A new 500-horsepower motor and also a large air compressor have been installed, and the coming year will undoubtedly witness an increased output from this property. The power to operate the motor comes from the Flint Creek dam, some 18 miles distant.

The statistical tables of the Montana production for the year 1902 that appear in connection with this review, showing the quantity and value of the production of the State, its origin by counties and classes, together with the final disposition of the ores and bullion for treatment or sale, have been compiled from confidential returns furnished by the producers of their output. The totals thus obtained are verified by the statistics of the United States mints and assay offices and by the summaries furnished from the records of the smelters and refineries:

Deposits at the United States Assay Office, Helena, Mont., during the Calendar Year 1902.

County.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Commercial value.	
Beaverhead	766.508	$14,260.61	313.49	$150.17	$14,410.78
Broadwater	1,264.687	23,529.10	204.48	94.60	23,623.70
Cascade	2.542	47.29	.99	.46	47.75
Choteau	203.981	3,791.99	66.78	30.72	3,825.71
Deer Lodge	913.158	16,988.96	124.44	56.41	17,045.37
Fergus	22,109.789	411,344.88	2,134.09	973.01	412,317.89
Flathead	2,398.459	44,622.47	346.83	162.49	44,784.96
Granite	1,598.194	29,733.85	431.36	197.64	29,931.49
Jefferson	879.365	16,360.26	254.90	116.58	16,476.84
Lewis and Clarke	24,865.090	462,606.23	9,171.68	4,324.73	466,930.96
Madison	15,094.921	280,835.68	3,391.27	1,588.92	282,424.60
Meagher	280.850	5,225.11	65.97	29.36	5,254.47
Missoula	3,061.096	56,950.61	116.99	53.91	57,004.52
Park	14,963.842	278,397.01	3,295.82	1,545.75	279,942.76
Powell	4,220.539	78,521.65	551.78	253.07	78,774.72
Ravalli	1,304.087	24,262.06	86.18	39.84	24,301.90
Sweet Grass	36.465	678.42	8.80	4.05	682.47
Silver Bow	1,896.339	35,280.71	369.66	170.20	35,450.91
Total, Montana	95,859.912	1,783,439.89	20,935.51	9,791.91	1,793,231.80
Alaska	20.597	383.19	6.39	2.94	386.13
Idaho	8,920.385	165,960.55	2,353.04	1,105.57	167,066.12
Nevada	3,446.153	64,114.45	1,501.69	702.74	64,817.19
Oregon	97.631	1,816.39	6.50	2.99	1,819.38
Washington	708.825	13,187.40	145.42	68.94	13,256.34
British Columbia	10,589.798	197,019.49	7,185.17	3,416.99	200,436.48
Northwest Territory	1,969.782	36,647.10	629.39	295.72	36,942.82
Jewelry	160.759	2,990.87	50.44	24.21	3,015.08
Redeposits	225.169	4,189.20	295.97	140.75	4,329.95
Total	26,139.099	486,308.64	12,174.01	5,760.85	492,069.49
Grand total	121,999.011	2,269,748.53	33,109.52	15,552.76	2,285,301.29

Bullion of Montana Production Deposited at the United States Assay Office, Helena, Mont., during the Calendar Year 1902.

Origin.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Commercial value.	
Placer gold	21,150.925	$393,505.47	2,685.17	$1,234.26	$394,739.73
Mill bullion	74,708.987	1,389,934.42	18,250.34	8,557.65	1,398,492.07
Total	95,859.912	1,783,439.89	20,935.51	9,791.91	1,793,231.80

Bullion of Montana Production Deposited at the United States Mints and Assay Offices during the Calendar Year 1902.

Institution.	Gold.		Silver.		Total value.
	Standard ounces.	Value.	Standard ounces.	Coining value.	
Mints:					
Denver, Colo	31.197	$580.41	10.73	$12.49	$592.90
Philadelphia, Pa	7,910.729	147,176.35	1,565.89	1,822.12	148,998.47
St. Louis, Mo	1,215.928	22,621.92	310.43	361.23	22,983.15
San Francisco, Cal	157.825	2,936.28	13.75	16.00	2,952.28
Assay offices:					
Boise, Idaho	7,057.728	131,306.57	1,991.75	2,317.67	133,624.24
Helena, Mont	95,859.912	1,783,439.89	20,935.51	24,361.32	1,807,801.21
New York, N. Y	12,449.483	231,618.28	14,497.83	16,870 20	248,488.48
Seattle, Wash	9,012.334	167,671.33	17.22	20.04	167,691.37
Total	133,695.136	2,487,351.03	39,343.11	45,781.07	2,533,132.10

Production of Gold and Silver in Montana (Origin Detailed) during the Calendar Year 1902.

Origin.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Placer dust	21,625.833	$447,045.65	2,416 66	$3,124.59	$450,170.24
Mill bullion	50,402.081	1,041,903.46	1,130,831.30	1,462,083.62	2,503,987.08
Cyanide bullion	62,458.742	1,291,136.79	166.088	214,740.04	1,505,876.83
In copper ores	52,304.118	1,081,222.08	9,058,715	11,712,279.26	12,793,501.34
In lead ores	4,360.347	90,136.37	410,737.51	531,054.56	621,190.93
In dry ores and concentrates, classed as smelting ores	21,703.502	448,651.21	2,860,948.33	3,699,003.89	4,147,655.10
Total	212,854.623	4,400,095.56	13,629,736.80	17,622,285.96	22,022,381.52

Disposition of the Gold and Silver of Montana Production during the Calendar Year 1902.

Disposition.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Deposited at the United States mints and assay offices	120,325.623	$2,487,351.03	35,408.80	$45,781.07	$2,533,132.10
Shipped to custom smelters and refineries by producers	92,529.000	1,912,744.53	13,594,328.00	17,576,504.89	19,489,249.42
Total	212,854.623	4,400,095.56	13,629,736.80	17,622,285.96	22,022,381.52

Origin by Percentages of the Production of Gold and Silver in Montana during the Calendar Year 1902.

Origin.	Gold.	Silver.
	Per cent.	*Per cent.*
Placer dust	10.16	0.02
Mill bullion	23.67	8.29
Cyanide bullion	29.34	1.22
In copper ores	24.57	66.46
In lead ores	2.08	3.02
In dry ores	10.18	20.99
Total	100	100

Production of Copper and Lead in Montana during the Calendar Year 1902.

Summary by counties.	Copper.	Lead.
	Fine pounds.	*Fine pounds.*
Beaverhead	90,713	562,781
Broadwater	5,000	863,000
Cascade		722,739
Flathead		3,500,000
Granite	3,000	4,000
Jefferson	164,052	75,000
Lewis and Clarke	10,588	86,962
Meagher		900,000
Silver Bow	210,960,175	101,842
Custom smelters in addition to the above not possible to distribute by counties	413,112	1,361,305
Total	211,646,640	8,177,629

Production of Gold, Silver, Copper, and Lead in the State of Montana from the Year 1862 to 1902 (inclusive).

Year.	Gold.	Silver (coining value).	Copper.	Lead.	Total.	Yearly increase (+) or decrease (−).
						Per cent.
1862 to 1881 (inclusive)[a]	$200,000,000	$11,000,000			$211,000,000	
1882	2,550,000	4,370,000	$1,539,860		8,459,860	
1883	1,800,000	6,000,000	3,452,960	$226,424	11,479,384	+37½
1884	2,170,000	7,000,000	5,386,500	246,326	14,802,826	+31
1885	3,400,000	11,500,000	6,779,800	274,350	21,954,150	+50
1886	4,422,000	13,849,000	5,761,200	494,132	24,526,332	+12
1887	5,978,536	17,817,548	8,853,750	607,662	33,257,496	+35½
1888	4,200,253	15,790,736	15,103,946	569,160	35,664,095	+ 7½
1889	3,500,000	19,393,939	13,334,970	456,975	36,685,884	+ 3
1890	3,300,000	20,363,636	16,656,437	675,392	40,995,465	+11½
1891	2,890,000	20,139,394	14,377,336	1,229,027	38,635,757	+ 5½
1892	2,891,386	22,432,323	19,105,464	990,035	45,419,208	+18
1893	3,576,000	21,858,780	16,630,958	964,089	43,029,827	− 5
1894	3,651,410	16,575,458	17,233,718	730,551	38,191,137	−11
1895	4,327,040	22,886,992	21,114,869	754,360	49,083,261	+28½
1896	4,380,671	20,324,877	25,356,541	670,010	50,732,099	+ 3½
1897	4,496,431	21,730,710	26,798,915	928,619	53,954,675	+ 6
1898	5,247,913	19,159,482	26,102,616	809,056	51,319,067	− 5
1899	4,819,157	21,786,835	40,941,906	909,410	68,457,308	+33
1900	4,736,225	18,482,211	39,827,135	701,156	63,746,727	− 7
1901	4,802,717	18,334,443	36,751,837	498,622	60,387,619	- 5
1902	4,400,095	17,622,285	24,606,038	332,747	46,961,167	−22
Total	281,539,831	368,418,649	385,716,756	13,068,103	1,048,743,344	

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[a] No annual compilations were made prior to 1881.

NEVADA.

By R. K. Colcord,

Assayer in charge of the United States mint, Carson City, Nev.

Nevada's production of gold and silver for the calendar year 1902 was:

Gold	$2,996,749
Silver (coining value)	5,169,627
Total production for the year 1902	8,166,376
Total production for the year 1901	5,173,392
Increase	2,992,984

As will be seen by the above figures, Nevada continues to show substantial improvement in her mining industry.

The remarkable extent and fabulous richness of the mines of Tonopah have caused an unusual amount of prospecting, and many new locations have been made, some of which have already become large bullion producers.

NYE COUNTY.

The now famous mining district of Tonopah, less than three years old, has become the leading mining center of the State. As yet there is no reduction plant in the camp; notwithstanding this, the bullion product of the ores for the year 1902, shipped hundreds of miles to be reduced, amounted to nearly 3,000,000 fine ounces, over half a million dollars of which was gold. Tonopah is now a town of 4,000 inhabitants, with about 50 mining companies operating there, several of which have substantial hoisting plants. There are two banks, several large hotels, and many brick and stone business houses, and a stock exchange.

The original Tonopah Company is preparing for the erection of a reduction works capable of handling 1,000 tons of ore daily, which, when completed, will turn out more bullion in the first six months than the entire State has produced in the past year.

The Nevada Company, operating at Berlin, has materially increased its yield of gold bullion and has an ample supply of ore blocked out to keep its 30-stamp mill in operation indefinitely.

Active prospecting work is being carried on in Gold Mountain, which employs about 50 miners, and much work of the same character is being prosecuted at Hannapah. At Lone Mountain very high grade ore is being taken out from two separate veins. It will be noted that Nye has become the banner county of the State, both as a gold and silver producer.

STOREY COUNTY.

There is no doubt that the cheapening of power, consolidation of management, and the scientifically economical mining and treatment of ores on a large scale will soon place many of the old mines of the Comstock Lode on a dividend-paying basis. During the year there has been erected the largest cyanide plant on the coast. This plant is capable of handling about 500 tons of tailings per day. The company has on hand about 400,000 tons of tailings and, it is understood, will erect a large crushing plant and then purchase dumps, ores, and lease or buy mines, etc. This company will doubtless operate here successfully for many years to come.

The bullion product of the Comstock shows no material increase during the year, owing principally to the fact that a changing from steam to electric power has been going on in many of the mines, which has prevented the extraction of ores. An electric pumping plant has just been installed by the Consolidated Virginia and California Company, which will easily handle the water to the 2,500 level, thus opening up 400 feet of practically unexplored ground along the lode, and giving the adjoining mines the opportunity of prospecting and mining their lower levels.

LINCOLN COUNTY.

This county, which has for several years been the largest gold producer, shows a falling off of over half a million dollars. This shortage was caused by changes and repairs at the reduction works of the Delamar Company, and the working of lower grade ores. Aside from the properties of this company there are several gold mines being developed and some have already become bullion producers. A much larger output may be expected from the mines of this county during the coming year.

EUREKA COUNTY.

Reports from this district show an improvement to the extent of nearly $100,000 over the previous year, practically all from silver-lead ores shipped to smelters.

ELKO COUNTY.

Elko has over half a million dollars to her credit for 1902 as a bullion producer, which is a very decided improvement, and if the present activity in mining continues during the coming year we may expect a still greater yield. This county has now become fourth in the list of bullion producers.

LYON AND LANDER COUNTIES.

These counties have each slightly increased their output, the former in gold, the latter in silver. In Lyon County there is considerable activity in the way of opening up some of the old copper properties, but thus far nothing of importance has been developed.

WHITE PINE COUNTY.

There is a vast mineral zone extending through this county on which extensive prospecting and development work is being done, but, owing to its isolated position—from 100 to 200 miles from the railroad—ores which would pay a good profit with cheap transportation can not, under present conditions, be handled at all. With the advent of a railroad this county will become an important and extensive mining region. The output for the year shows a slight falling off, both in gold and silver.

WASHOE COUNTY.

The only gold district in Washoe County, as far as known, is Olinghouse. The mines of this camp are being operated in a small way and are regular producers, though there has been but a slight increase in the yield during the year. At Wedekind (the Sparks mine, near Reno) the new reduction works was completed early in the year and are running successfully, which fact greatly increased the output of bullion from this county. No new developments have been made.

THE OTHER COUNTIES.

All the other counties of the State have been producers, though none of them have increased their production over that of 1901. The greatest amount was from Nye County—$4,023,963.71—and the smallest, Douglas County, with $481.30.

The following table of comparison of the total production of gold and silver of the State for the years 1899, 1900, 1901, and 1902 will be of interest, as showing the annual increase:

Metal.	1899.	1900.	1901.	1902.
Gold	$2,498,910	$2,023,803	$3,099,566	$2,996,749
Silver (coining value)	1,241,880	1,931,075	2,613,826	5,169,627
Total	3,740,790	3,954,878	5,713,392	8,166,376

Bullion of Nevada Production Deposited at the United States Mints and Assay Offices during the Calendar Year 1902.

Institutions.	Gold.		Silver.	
	Weight.	Value.	Weight.	Coining value.
	Standard ounces.		*Standard ounces.*	
Mints, San Francisco	13,631.111	$253,602.07	4,344.78	$5,055.59
Assay office, New York	6,134.996	114,139.46	8,229.54	9,575.89
Total	19,766.107	367,741.53	12,574.32	14,631.48
To which add returns from custom smelters and refineries	141,309.178	2,629,007.94	4,430,212.69	5,154,995.48
Grand total	161,075.285	2,996,749.47	4,442,787.01	5,169,626.96

Production of Gold and Silver in Nevada during the Calendar Year 1902.

County.	Gold (value).	Silver (coining value).	Total value.
Churchill	$5,000.00	$8,000.00	$13,000.00
Douglas	475.20	6.10	481.30
Elko	240,316.80	266,346.79	506,663.59
Esmeralda	79,879.11	30,439.55	110,318.66
Eureka	91,189.28	531,930.31	623,119.59
Humboldt	62,208.82	80,105.92	142,314.74
Lander	80,650.36	148,273.84	228,924.20
Lincoln	668,917.40	180,939.91	849,857.31
Lyon	150,510.90	141,097.67	291,608.57
Nye	873,436.65	3,150,527.06	4,023,963.71
Ormsby	14,492.05	43,897.62	58,389.67
Storey	489,690.94	411,402.23	901,093.17
Washoe	79,821.30	85,612.76	165,434.06
White Pine	160,160.66	91,047.20	251,207.86
Total	2,996,749.47	5,169,626.96	8,166,376.43

SOURCE OF PRODUCTION.

Source.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Value.
Placer	757.025	$15,649.10		
Quartz	144,210.731	2,981,100.37	3,516,259.20	$4,546,274.52
Silver-lead ores			482,124.15	623,352.44
Total	144,967.756	2,996,749.47	3,998,383.35	5,169,626.96

THE COMSTOCK LODE.

By ALFRED DOTEN, *Virginia City, Nev.*

The anticipated financial advancement and prosperity of the old Comstock Lode during the past year has not appeared largely in evidence, yet there has been an advance and a strong tendency toward improvement over adverse circumstances. This has been promoted through the gradual introduction of electric power, during the last year or two, taking the place of the obsolete and expensive old steam machinery, all of which had to be accomplished by slow degrees.

There was an increased amount of ore produced and worked during the year, including low grade and mill tailings, bringing the bullion yield up to above that of the previous year, considerably above the million mark, and more extensive arrangements are being inaugurated for greater progress in that respect for the present and coming years.

The Consolidated California and Virginia mine has been in the lead for the last two or three years in both bullion production and advancing development, and its persistent, well-earned success has inspired other companies also to renewed effort. All the mines having at last discarded their old steam machinery for electric works, they are better prepared than ever to resume active operations for the renewed production of ore from deep mine workings and explorations again.

A great deal of dead work was performed in this way, by the efficient aid of the new electric machinery, especially in the Union and other big mines in the north end, Cedar Hill section, with good prospective results, and more men are employed in, on, or about the Comstock than for years past. But the great tendency underlying mining operations generally during the last year has shaped itself toward the resumption of operations at the lower levels of the mines, following the confident and lucrative example of the Consolidated California and Virginia.

One thing is certain, that the old Comstock is not yet played out, and whenever she undertakes to carry a mining boom on a large scale, she has both the means and the energy left to carry it through all right.

INTERESTING FINANCIAL EXHIBIT.

The following carefully revised and prepared tabular statement of the regular assessments levied and dividends disbursed in the rich financial history of the Comstock, from commencement until the first of the present year, recommends itself to the careful consideration of all practical students of mines and mining manipulation. It comprehensively includes the representative mines of the great lode, commencing at the north end and following in succession southward through Virginia and Gold Hill to Silver City, a distance of about 4 miles, or the length of the Sutro Tunnel:

Name of mine.	Number of feet.	Number of shares.	Total amount of assessment.	Total amount of dividends.
Utah Consolidated	1,500	100,000	$540,000	....
Sierra Nevada	4,400	100,000	6,880,910	$102,500
Union Consolidated	1,000	100,000	2,745,000	....
Ophir	675	100,800	4,865,408	1,592,800
Mexican	600	100,800	2,395,250	....
Consolidated California and Virginia	1,310	216,000	3,497,100	84,324,900
Best and Belcher	540	100,000	2,792,273	....
Gould and Curry	612	108,000	4,812,650	3,837,600
Savage	771	112,000	7,410,600	4,460,000
Hale and Norcross	400	112,000	5,817,980	1,850,000
Chollar	700	112,000	2,159,600	750,000
Potosi	700	112,000	2,275,920	....
Bullion	943	100,000	3,145,000	....
Alpha	306	105,000	331,800	....
Exchequer	400	100,000	1,023,000	....
Imperial Consolidated	468	500,000	2,221,000	500,000
Challenge Consolidated (including the Bowers and other small Gold Hill mines adjoining)	150	50,000	460,000	4,800,000
Confidence	130	24,960	568,588	201,490
Yellow Jacket	1,200	120,000	5,890,000	2,196,000
Kentuck	90	105,000	128,450	1,350,000
Crown Point	641	100,000	3,045,000	11,903,000
Belcher	1,040	104,000	3,684,600	15,397,200
Segregated Belcher	1,324	100,000	391,000	....
Overman	1,200	115,200	80,640	....
Caledonia	2,188	100,000	3,285,000	....
Justice	2,100	105,000	3,720,750	....
Alta	600	108,000	3,713,310	....
Silver Hill	1,200	108,000	2,220,200	5,400
Total	....	....	80,101,029	133,273,890

Excess of dividends over assessments, $53,172,861.

SUPPLEMENTARY PROPOSITIONS.

This table is of especial interest to those who have paid, and are still paying, those inevitable regular assessments, as well as gratifying to the recipients of the munificent dividends, especially when they so liberally exceed the sum of the assessments. And it indicates the several dividend-paying mines, as well as the many which never gave up a cent; as, for instance, the misnamed Bullion mine, situated right in the heart of the Comstock, assessed in all over $3,000,000, which never yielded a pound of bullion nor a ton of pay ore. Yet that very mine, simply from the value of its location, is going to be utilized before long as a means of reopening valuable ore deposits in mines adjoining, which will yield plenty of gold and silver bullion.

Dividends cut but a small figure during last year as compared with the assessments; in fact, assessments were far in excess for the year, owing to the heavy expense of changing the ponderous and expensive old steam machinery from steam to electric power, which is universally done, about the last to adopt the change being the Consolidated California and Virginia, the great chief producing mine of the Comstock. Considerably over a million dollars was expended in new electric machinery along the lode during the year, inducing somewhat of a falling off of the ore product for the time, between 500 and 600 men, miners, mechanics, and electricians being employed. It will also be noticed that many of the mines, although continuously worked, utilized all their own product, as well as sundry assessments to pay running expenses. The best as well as the poorest portions of the extensive lode are clearly indicated in the table.

MINING CAPITALIZATION.

The number of feet and shares in each mining incorporation is also given in this tabular statement as a study in modern capitalization.

In the old Comstock incorporation days a share to the foot was common—1,000 feet, 1,000 shares—and even to-day it will be seen that the capitalization remains at the same reasonable figures that have ruled the stock market through all its wildest or its tamest vicissitudes down to the present time. The Utah Consolidated, the first mine on the list, and the only one having the present statutory number of feet—1,500—has only 100,000 shares, and next comes the Sierra Nevada with 4,400 feet and but 100,000 shares, upon which she paid dividends amounting to $102,500; and so with a large majority of the rest regardless of their respective number of feet. But Comstock capitalization did not seem to be ruled much by the number of feet in the mine. At any rate, none of those mines split up their stock into wildcat hairs.

Silver Hill, now the only dividend-paying mine on the Comstock, pays regularly 5 cents per share on her 108,000 shares, with a comfortable amount left in the treasury. Five cents a share dividends on some million-share mines would bankrupt them forever.

Nowadays any new outside 1,500-foot mining claim is located and incorporated with its capital stock fixed and advertised at not less than a million or two million dollars. This, of course, is intended to facilitate the sale of the stock at low rates among the people, especially the few thousand shares considerately set aside for sale to raise "working capital—unassessable." The result is that those stocks do not find a ready market. Too much of a good thing. Comstock mining stocks continue to be regularly bought or sold at the regular daily stock-board quotations, based upon practical reasonable capitalization.

BULLION RESCUED FROM MILL TAILINGS.

The saving of gold and silver left in the ore tailings after passing through the mills did not amount to much in the earliest years of Comstock ore reduction. There was plenty of rich free-milling ore to be worked, and if the proceeds came up to 40 or 50 per cent of the assay value it was considered pretty good returns, the rest being allowed to run off down the canyons toward Carson River, or through the several large river mills directly into the river itself. About $60,000 is computed to have been thus lost before blanket sluices and other saving appliances were adopted at the mills to catch the heavy sulphurets, and huge dams and reservoirs placed for the purpose caught up many very extensive tailings deposits for future reference.

Gold being much the easiest amalgamated and saved in the mills, the greater part of the precious metals escaping was silver. Important improvements in ore reduction have gradually been adopted in milling, some claiming to work the ore to within less than 90 per cent of the assay value, consequently the mill tailings of to-day are not to be compared with those of the early times as a source of lucrative salvage. Various devices and concentrating appliances have been brought into use in times past to work these immense deposits of old tailings, but the cyanide process proves to be the best and most effective of all, giving largely increased results the last few years.

The various cyaniding ore-tailings plants of Carson River, Silver City, and Virginia, materially assisted by the great new Butters plant in Sixmile Canyon, give a much-increased aggregate bullion yield for 1902, as follows: Tons, 125,400; gold, $205,000; silver, $196,200; total,

$401,200, being nearly four times that of the previous year. This, added to the annual production from the commencement, gives the following bullion summary:

Period.	Tons.	Gross yield or value.
To and including 1901	3,186,500	$18,048,633.16
For the year 1902	125,400	401,200.00
Total	3,311,900	18,449,863.16

THE CHAMPION CYANIDING PLANT.

The new and extensive cyaniding plant of the Charles Butters Company, constructed at great expense in Sixmile Canyon, 3 or 4 miles northeast, or below Virginia, did not achieve what it was popularly expected to do—more and better work than all the other cyanide plants of the Comstock put together—but although it much outdid any other single plant during the year, it is not yet completed and in full working order. More leaching or dissolving vats are to be added and improved appliances brought to bear in the matter, greatly increasing its capacity and effectiveness. It has cost about $400,000 thus far, and will cost as much more to perfect and carry out all its plans and details.

The Butters company has secured possession of a vast amount of old mill tailings, including some of the oldest and heaviest deposits, also several low-grade surface-ore propositions in the mines, as well as some mighty mining-shaft dumps of what was considered waste ore, or too poor to work in bonanza days, including those of the Hale & Norcross, Chollar, and other middle mines, enough to keep the plant in steady work for ten years at least. The Butters plant, being eligibly situated down in the steep canyon, a thousand feet lower than the surface of the mining shafts and dumps of Virginia, the tailings are very readily and cheaply conducted through wooden flumes by means of water directly to the plant for treatment, thus making the whole Virginia basin tributary to the plant without horses, wagons, or railroads.

A recent achievement has been the purchase of the great dump of the old Imperial mine, the largest on the Gold Hill slope of the Divide, estimated at 100,000 tons. This will all have to be hauled in wagons, about a mile, to the Best & Belcher, formerly the Gould & Curry mill, where, by means of the Kinkead gyratory grinders employed, the ore will be reduced to a coarse cyaniding pulp and sent smoothly and noiselessly down through the water flumes to the plant in the canyon. Other small mills are to be similarly employed on the low-grade mining ores, water flumes reaching out and doing all the transportation from any point, and eventually—in a year or two, perhaps—the already famous Butters plant, with its own cheap, improved application of the cyanide process, will become literally the octopus of the great tailings and low-grade ore proposition, adding numerous thousands to the annual production of the Comstock.

SUMMARIZED COMSTOCK BULLION YIELD.

No more expressive illustration of the grand bullion wealth, the munificent gold and silver production, and the varying fortunes of the old Comstock Lode can be given than the subjoined tabulated exhibit of its annual yield from the beginning, through the years of its worldrenowned existence to the present time. It was originally compiled and published in its present form nearly twenty years ago, under Government auspices and direction, at considerable expense, from the most authentic and reliable authorities, and has since been revised and added to regularly, year after year, its authentic correctness always remaining uncontroverted and unimpeached.

Commencing with the few weeks of prospective work with pans and rockers, before winter interfered, although black silver sulphurets were found secondarily commingled with the rich free-gold discovery, no one fully understood its real value or importance, or how to utilize it; therefore only gold to the extent of about $30,000 was washed out of the surface diggings. The result of virtually the first year's real mining operations, in 1860—three regular stamp mills being brought over the mountains from California—was $780,000, considerably over one-half of which was gold. The next year, $3,500,000 was the product, and the next $7,000,000, and it was not until the fourth year that silver predominated in the first silver mine of the United States discovered as a gold mine, the yield for that year (1863) aggregating $12,400,000, or nearly $24,000,000 for the first four years.

TOTAL GOLD AND SILVER PRODUCTION OF THE COMSTOCK LODE FROM DISCOVERY AND COMMENCEMENT, BY CALENDAR YEARS, TO DATE.

Years.	Ore (tons).	Gold.	Silver.	Total.
1859		$30,000.00		$30,000.00
1860	10,000	550,000.00	$200,000.00	750,000.00
1861	140,000	2,500,000.00	1,000,000.00	3,500,000.00
1862	250,000	4,650,000.00	2,350,000.00	7,000,000.00
1863	450,000	4,940,000.00	7,460,000.00	12,400,000.00
1864	680,450	6,400,000.00	9,600,000.00	16,000,000.00
1865	430,745	6,133,488.00	9,700,232.00	15,833,720.00
1866	640,282	5,963,158.00	8,944,737.00	14,907,895.00
1867	462,176	5,495,443.20	8,243,164.80	13,738,608.00
1868	300,560	3,391,907.60	5,087,861.40	8,479,769.00
1869	279,584	2,962,231.20	4,443,346.80	7,405,578.00
1870	238,967	3,481,730.16	5,222,595.24	8,704,325.40
1871	409,718	4,099,811.46	6,149,717.19	10,249,528.65
1872	384,668	4,894,559.86	7,341,839.79	12,236,399.65
1873	448,301	8,668,793.40	13,003,187.13	21,671,980.53
1874	526,743	8,990,714.06	13,486,071.09	22,476,785.15
1875	546,425	10,330,208.62	15,495,312.92	25,825,521.54
1876	598,818	12,647,464.08	18,971,196.12	31,618,660.20
1877	562,519	14,520,614.68	21,780,922.02	36,301,536.70
1878	272,909	7,864,557.64	11,796,836.47	19,661,394.11
1879	178,276	2,801,394.33	4,202,091.49	7,003,485.82
1880	172,399	2,051,606.00	3,077,409.00	5,129,015.00
1881	76,049	430,248.00	645,372.00	1,075,620.00
1882	90,181	697,385.60	1,046,078.40	1,743,464.00
1883	125,914	802,539.54	1,203,809.29	2,006,348.83
1884	188,369	1,261,313.60	1,577,438.40	2,838,752.00
1885	226,147	1,729,531.25	1,415,071.04	3,144,602.29
1886	238,780	2,054,920.15	1,681,298.31	3,736,218.46
1887	223,682	2,481,176.85	2,030,053.78	4,511,230.63
1888	271,152	3,169,209.07	4,458,058.66	7,627,267.73
1889	286,144	2,590,973.32	3,358,949.95	5,949,923.27
1890	286,075	1,992,349.03	2,988,523.56	4,980,872.59
1891	188,647	1,380,857.02	2,071,285.53	3,452,142.55
1892	133,678	1,043,158.86	1,130,088.77	2,173,247.63
1893	109,780	1,123,262.54	748,841.70	1,872,104.24
1894	97,049	768,880.63	512,587.09	1,281,467.72
1895	63,558	548,873.68	365,915.79	914,789.47
1896	39,240	340,253.36	226,835.57	567,088 93
1897	17,850	223,808.63	149,205.76	373,014.39
1898	10,766	123,023.89	82,015.92	205,039.81
1899	6,780	103,006.74	68,671.16	171,677 90
1900	35,300	381,123 56	319,441.70	700,865.26
1901	56,577	746 477 00	521,032.00	1,267,509.00
1902	96,490	785,030.59	495,944.96	1,280,975.55
Total	10,851,748	148,145,385.20	204,653,039.80	352,798,425.00
Total mill tailings added				18,449,863.16
Grand total				371,248,288.16

THE LONGEST, RICHEST DRIFT IN THE WORLD.

In 1864 the rich yield was $16,000,000, and in 1877 culminated the grand height and glory of the big bonanza days, the product for that calendar year being $36,000,000, the best year's record of the old Comstock. And it was during that year that the thousands of visitors were shown the famous "long drift" on the 1,550-foot level of the Consolidated Virginia and California mine.

The great bonanza was a regular shaped oblong body of high-grade ore carrying high values in silver and gold, three-fifths being silver. It was about 1,300 feet in length, and the aforesaid long drift was a crosscut through its widest part, the "heart" of the big bonanza, the drift being over 100 feet long, with top, bottom, and sides all in very high-grade ore, $1,000 per ton, without a pound of waste anywhere throughout its entire length. John Mackay, one of its principal owners, claimed it to be "the longest, richest drift anybody in the whole world ever saw, or would ever see again." No wonder, at the magnificent bullion yield and the liberal regular bonanza dividends, $108,000 per month.

A long, gradual decline followed, with the exhaustion of the rich ore body, the production of the Comstock falling below the million mark in 1874. In 1901 it got up above it again, with a further increase for last year, 1902, to over a million and a quarter, as shown in the table.

The total yield of the Comstock Lode to date, as given in this table, foots up to over $371,000,000, yet all who were familiar with the old-time mining and milling methods know that millions were handled with perfect looseness, with surreptitious leakages, especially in the flush and rapid early times, and that the square actual yield of the Comstock should amount to nearer $500,000,000. Some, in fact, guess it up to $800,000,000 or more, and one of our sanguine-minded Congressmen recently published it at $600,000,000. The table, however, is not responsible for illegitimate estimates any more than for the $60,000,000 tailings' loss in Carson River. It is simply an honest record of what bullion was "in sight" and none other.

THE SUTRO COMSTOCK TUNNEL.

The old Sutro tunnel, commenced in 1869 and completed ten years later, in 1879, nearly 4 miles in length, has always been considered one of the most important factors in the Comstock mining situation. Intersecting the great lode at a central point in the Savage mine, nearly 1,700 feet in depth, or about midway between the surface of the principal shafts and the deepest mine workings, 3,300 feet, its chief practical service has been and still continues to be as a drain tunnel, all the water from the upper levels flowing out through it by gravitation, and 1,700 feet of pumping being thus saved in raising the water from the lower levels. The principal revenue of the tunnel for the general drainage of the lode has been derived from royalties per ton on ores extracted from the various mines, amounting in the most flourishing bonanza times to a munificent sum. Comparatively little ore now coming to the surface through the various mining shafts, the revenue of the tunnel is absorbed in keeping the vast amount of timbering throughout the tunnel and its branches in repair.

The drainage capacity of the tunnel and its branches, 7 miles in extent, is simply sufficient to handle all the water that is ever likely to be elevated from below its level by any present or future operation throughout the entire extent of the lode, including all water that may be added at any time from drainage of the Silver City or the American Flat districts or from any westward exteision beyond the Comstock.

The only mine raising water from deeper working below the tunnel is the Consolidated, California, and Virginia, which with its electric pumps discharges into the tunnel the enormous quantity of 400 miners' inches of water per minute or 6,624,000 gallons every twenty-four hours, which it would be totally impracticable to dispose of in any other way. Indeed, were it not for this tunnel preserving the drainage, the 7,000,000 gallons flowing through it would have to be raised 1,700 feet to the surface or deep mining totally abandoned on the Comstock Lode.

ADVANTAGEOUS MILLING.

The practical facilities offered by the Sutro tunnel for the transportation of waste low-grade ores, etc., found in the various mining explorations of the lode, are far superior to any other method of utilization, as illustrated by the fine 10-stamp mill belonging to the company, constructed a couple of years ago, near the mouth of the tunnel. It does excellent work, reducing 60 tons per day of what was considered low-grade waste ore taken out of the tunnel workings in the Comstock. It only yields about $3 per ton, but costs little for handling and nothing for the water power furnished by the liberal stream flowing from the Comstock through the tunnel; therefore a good profit is realized. This water power is amply sufficient, and with increase from extensive Comstock pumping, the mill can and will be increased to double the capacity with perfect facility.

DISASTROUS BREAKDOWN.

A great breakdown of the powerful hoisting machinery at the C. & C. shaft of the Consolidated California and Virginia Mining Company occurred March 28 last, seriously affecting the revenue of the Comstock, that being the principal productive mine on the lode, and throwing over a hundred men out of employment for about three months. The long anticipated and prepared for changes from steam to electric power were being made, a 500-horsepower variable speed motor on balanced electric hoist, being introduced. The change included the starting of the new Reidler electric pumps, the first on the Comstock, and a large number of people, including some from San Francisco, were present, waiting to be lowered into the mine to witness the working of the pumps. Suddenly, with a dull crack, the huge 16-inch shaft of the hoisting engine broke, and everything came to a standstill. Many of the guests, however, went down into the mine through the shaft of the Union mine near by. The new electric pumps installed on the 2,150 foot level worked to absolute perfection, but no hoisting, or necessary lower water drainage could be performed until the engine shaft could be sent to San Francisco for repairs and returned to work. Electric hoists have also been installed in the Utah and Andes mines near by, air compressors and fans placed in other mines, and the means for more effective and remunerative work are better than ever, giving good promise for the future.

REVIVAL IN MINING OPERATIONS.

Since repairing the great machinery break, more men have been put to work in the Consolidated California and Virginia mine than before, and ore extraction with further mining development is resumed with renewed vigor and effectiveness. The submerging water of the lower levels has been reduced with perfect ease as fast as required, pumps lowered to within 200 feet of the bottom of the shaft, which is 2,500 feet deep, and considerable work done repairing and straightening up those reclaimed lower levels. Some good pockets and veins of ore have already been reached and more is anticipated, increasing the regular output of the mine.

Active mining is also to be resumed in a lucrative portion of the Best and Belcher mine adjoining the C. & C. shaft on the 2,050 foot level. The Ophir on the north is getting at increased ore resources, and the Sierra Nevada and Union are bringing their new electric machinery into effective prospecting work. The Yellow Jacket and Belcher mines in the Gold Hill section, being fully provided with electric machinery, are perfecting and developing plenty of low-grade ore. The old Brunswick mill on Carson River, after several years' rest, is being made ready to start up again on Yellow Jacket ore.

Away down at the south end, near Silver City, the old Silver Hill mine continues its regular output of ore that occasionally pays small dividends, being the only mine on the lode that does so. The Justice, Caledonia, and Overman are also producing some ore, and all are completing the introduction of electric machinery in place of their old steam works.

The increase in the bullion output in 1902 over the year before was not as much as was anticipated, but it will show a good further increase for the present year. The immense new Butters cyanide plant, and the smaller ones as well, will double their product, and, in fact, everything points to a general revival of mining operations all along the lode.

THE UNWATERING OF THE COMSTOCK.

And now, most important of all, comes the practical unwatering of the lower levels, which have remained fully submerged since October, 1886. The time had then arrived when it was found impossible, with the big hydraulic pump in the Chollar-Norcross-Savage Combination shaft—3,260 feet vertical depth—to keep the immense flow of water reduced or controlled any longer; the utmost limit of power was reached, and the mines had to be allowed to fill up, the water subsequently rising over 1,500 feet, or nearly up to the Sutro tunnel level.

The mines of the Gold Hill section had already been submerged five or six years before by a great flood of water tapped by a joint drift being run into the 2,400 foot level of the Alpha and Exchequer mines.

During the last two or three years the successful working and continued deeper drainage of the Consolidated California and Virginia mine, by means of its improved hydraulic pump, and latterly by the much more powerful and effective Reidler electric pumps, has had the effect to drain or lower the submerging water in the adjoining mines along the lode for some hundreds of feet in depth throughout the Virginia section.

A combination of the companies controlling the Gould & Curry, Savage, Potosi, Bullion, Exchequer, Alpha, and Julia mines has now been formed, to be known as the Ward Shaft Association, under the efficient superintendency of Leon M. Hall, the well-known general Comstock electrical engineer. The object of this association is to put the Ward shaft in first-class condition for the active resumption of prospecting work and further exploration in all the mines mentioned, and also to reopen and work the good and extensive ore bodies known to exist in the Alpha and Exchequer mines before the submerging flood.

EXCELLENT BASE OF OPERATIONS.

The Ward shaft belongs to the Julia Mining Company, and is the most eligibly situated of any, being located at the "Divide," between Virginia and Gold Hill. It has been idle for several years past, but well housed, and its powerful machinery in good condition; this will, however, be superseded by adequate electric machinery. The shaft is 1,800 feet deep, extending below the Sutro tunnel, with which it connects by a short drift. The Ward is the best located and most eligible of any shaft in that section for the objects to be accomplished, and will render very efficient aid in the unwatering of the Comstock and deeper mining explorations. And in this connection it is proposed to put the old Sutro tunnel in a thorough state of repair and best possible condition throughout, for extended ventilation and drainage purposes.

ANOTHER STRONG POINT.

The old Forman shaft of the Overman and Caledonia mines, farther down the range, opposite Gold Hill, was also considered an important point in Comstock deep development, being sunk to the depth of 2,400 feet, with its powerful surface hoisting and pumping plant, costing over a million dollars. But after being idle for some years the works were destroyed by fire a few months ago. It was also made an initial point in the southern extension of the Sutro tunnel, with which it was connected, to the American Flat, Gold Hill, and Silver City mines.

This shaft is now being retimbered and put in the best condition for installing an air-lift elevator and auxiliary electric plants, to unwater the flooded lower levels of the Gold Hill mines. These levels are submerged to the depth of 1,500 feet or more, but when the bottom, or 2,700-foot level, of the Belcher mine is reached, better stringers of high-grade ore and better indications for an old-time bonanza will be met with near the south line than can be shown anywhere else along the bottom levels of the Comstock Lode.

THE BIG COMSTOCK DRILL NOT A SUCCESS.

The new and very promising proposition to cheaply prospect the eastern, or Brunswick section, of the Comstock Lode by means of a big drill, boring holes down from the surface, enterprisingly introduced by some of the middle mining companies nearly two years ago, has met with little or no tangible success thus far. It is known as the Davis calyx drill, and is simply operated at the lower end of a series of long poles, as in artesian well boring, except that the drill itself is like a hollow augur, cutting in a circle and bringing out a core. And it is of different sizes—from four to ten inches in diameter—as found requisite, its proprietor or managers using steam, electric, or any other power, as they see fit.

Commencing with a 4-inch drill they made rapid progress, but at 460 feet it struck loose material, and not having any shell or casing to protect it, got stuck or "fitchered," to use a common Cornish drilling term. They sent East for proper casing, and the drill was finally rescued after a month's rest. A smaller drill had next to be used, with smaller casing to correspond, driven down inside of the other. This had to be successively done until at the depth of 850 feet the drill used was too small for satisfactory demonstration. Other and larger holes were driven down at sundry points in the vicinity, reaching about the same depth and ending principally in very low-grade quartz or loose porphyritic vein matter.

The fifth and largest hole is, or was, being bored recently, but at last accounts it had not reached the depth of either of its predecessors, and the drill was badly stuck with no hope of release. The trouble is that, although the drill works well, even without casing, in the firm, smooth-surface porphyry, which it brings out in long, solid cores, it can not well help getting stuck, or "fitchered," in brittle loose quartz and vein matter. Mining men generally, who have interestedly watched the progress of this great drilling experiment, do not approve it as a cheap and effective method of prospecting for veins or deposits of ore at any great depths. It is too indefinite and uncertain. Even without waiting to examine or assay the drillings, the first sign of striking a quartz deposit is when the drill becomes "fitchered."

TONOPAH, NEVADA'S RICHEST NEW SILVER DISCOVERY.

By Alfred Doten.

Tonopah prospered exceedingly during the last year—in fact, prospered to the extent of its present facilities. The town has grown to a population of about 4,000 people, including many families, fine residences and business buildings, a well-attended public school, 3 churches, 2 weekly newspapers, and a double stage line from the railroad, still 60 miles away.

During the last two or three months, however, the boss camp has come to a stand still, owing to delay in the projected establishment of extensive ore reduction works, the building of the railroad extension into Tonopah, water works, and necessarily limited ore shipments to Salt Lake and elsewhere for reduction. The Tonopah Mining Company, owning the original group of mines, have been shipping only their highest grade ores, extracted in the course of mining development, keeping only about 200 men steadily employed and about as many more are engaged in prospecting and developing other mining claims in the district. Thus it is that many people come and go, but the population does not increase, and the great Tonopah rush has subsided for the present.

The eight original claims of the group, located by Jim Butler and sold by him to the Philadelphia syndicate for $366,000, included all the eligible ledge croppings in sight, and each claim, consisting of 1,500 feet in length by 600 in width, adjoining each other, the whole group does not cover a great extent of ground. But their phenomenal silver richness, especially the Mizpah ledge, creating an immense excitement, enterprising miners came rushing in from all directions, and the whole surrounding vicinity was staked off into 1,500-foot claims very shortly, regardless of any ledge croppings or surface indications.

PRELIMINARY PROPOSITIONS AND CAPITALIZATION.

The main trend or strike of the outcropping ledges is nearly east and west, and a few of the claims outside in either direction from the main Tonopah group have developed good ore by sinking shafts down through the heavy porphyry or andesite capping which covers the general surface of the country. Scores of claims also run lengthwise in all directions, north and south as well as east and west, at cross-purposes, as though the locators were uncertain as to what direction the leads really do run in. Some in reality advocate the north and south theory as depth shall be attained, but the direction of the surface croppings may be relied upon to settle that point. The great multitude of outside claims are barren of results, the majority of them being owned by men who can not afford to sink deep shafts on any desperate uncertainty. They therefore philosophically prefer to visit and watch the success of their neighbors.

But meanwhile many have incorporated under the State laws and with all sorts of pretentious names, frequently getting the cabalistic word Tonopah in combination for interested effect. The favorite style is 1,000,000 shares, par value $1,000,000, advertising the placing of 200,000 shares or thereabouts on the market for sale as working capital to run the mine with. The result was a flood of wild-cat stocks drowning out the market, to the detriment of the really meritorious, legitimate stocks which, however, find private market with sufficient facility, the greatest objections even to them being their over-capitalization.

THE LEASERS AND REDUCTION WORKS.

During the few months that the leasers under Butler & Co. were so busily engaged in rushing out the rich ore of the surface croppings on 25 per cent royalty before their leases would expire, they shipped the richest selections to the Selby Reduction Works, San Francisco, and elsewhere, to get needed "working capital," at a cost of $50 or $60 per ton for transportation alone; and so diligently did they improve their time that when their leases expired they had accumulated 20,000 tons of ore on their various dumps. Considerably over one-half of that still remains on the dump awaiting cheaper reduction, which they will soon have right at home.

A comparatively small amount of all the ore that has been developed and uncovered in the mines of Tonopah has found its way to distant reduction works, but that has given good returns, as only the richest ore could pay the grievous expense of transportation. The true solution of the great Tonopah problem as to the real value of her average ores and mining lies in practical reduction works established right at the mines. This was strongly talked of being done on a large scale in the first year of bullion production, but somehow failed to materialize. The rich ore was shipped to smelters and mills all over the coast with various results, some lots hardly paying expenses. It is said that the best and most satisfactory returns were made by the Kinkead mill at Virginia, and two or three small mills of that pattern are contracted for, to be placed at or near Tonopah. And it must be borne in mind that over three-fourths of Tonopah's bullion product is silver, not gold, making the ore more difficult to work, but being so very rich in silver it pays equal to a gold mine. Moreover, by modern improved processes and appliances, silver is worked very much cheaper than it was years ago, or before it was demonetized. Tonopah's wealth lies in her great abundance of silver; her mines pay richly for working, and any advance in the price of silver will make them pay still better.

THE FIRST MILLS FOR TONOPAH.

The first ore-reduction mill introduced at or near Tonopah a few weeks ago was a small Kinkead gyratory, or grinding mill, which operated very successfully, working that difficult ore up to above 90 cents of the assay value per ton. But it subsequently got involved in litigation and suspended. Other mills of the same kind were ordered for neighboring localities.

But the most practical immediate solution of the chronic problem is that of the fine mill now being erected by the Tonopah Mining, Mill and Development Company, right in the heart of the mines, to be completed and in crushing order before the next snow flies. It will consist of 10 stamps weighing 1,350 pounds each, in double battery, assisted by two powerful Huntington grinders, with pans, settlers, cyaniding tanks, and everything complete, capable of reducing 60 tons of ore per day.

It is being erected on the ground of the Midway Mining Company, its first object being to work the ore still remaining on the dumps of the leasers near by, followed by general custom work. When finished it will be one of the most thoroughly substantial and complete mills in the State and a credit to the company, which is composed of some of the chief mining men and leasers. It is officially announced that the main Tonopah mining company propose erecting at or near that place the largest and best milling and reduction works ever constructed in the West, some time next year. They have had it under consideration long enough to decide fully and do something pretty good in that line, but this other new mill is fast becoming an accomplished fact.

ENTIRE BULLION PRODUCT OF TONOPAH.

The following tabulated statement gives the total silver and gold production of Tonopah during the two and a half years she has been producing bullion. The figures are strictly and officially correct. The apparent discrepancy or falling off during 1903 is accounted for by the returns of 1902, including proceeds from leasers' ore, and that of 1903 represents only the ore taken out in the course of development work and the bullion returns from the smelters or reduction works during the six months to July 1. The number of tons shipped are comparatively nothing as compared with the thousands of tons on the surface or in the mines awaiting the advent of home reduction.

Year.	Tons.	Silver.	Gold.	Total.
1901	2,534	$374,109.62	$202,035.82	$576,145.44
1902	11,258	1,234,270.99	558,858.30	1,793,129.29
1903 (Jan. 1 to July 1)	3,196	419,818.36	161,498.64	581,317.00
Grand total	16,988	2,028,198.97	922,392.76	2,950,591.73

The silver in this table, which amounts to 3,090.394.98 ounces, is figured into commercial value at regular market rates. The gold, amounting to $34,930.09, of course, has its own fixed standard value and is figured accordingly, but the price of silver bullion fluctuates somewhat under financial manipulations. Nearly three millions in two years and a half certainly is a splendid showing for so young a camp, especially in view of the policy adopted of not marketing any more of the ore than necessary to pay running expenses and holding it in reserve for cheaper reduction at home, avoiding costly transportation abroad. And it will be observed, in the table, that the ore selected for shipping realized about $174 per ton, one-fourth of which amount had to be paid for its transportation alone. No wonder they wanted to avoid that bit of expense and adopt home reduction. The Comstock only produced $3,500,000 in bullion during the same commencement period—two years and a half.

TONOPAH ORE "IN SIGHT."

If what is, or has been enthusiastically alleged to be, "in sight" in the way of fabulously rich ore at Tonopah were half true it would be the richest mining camp in the world. Pretended experts from all parts of the country have given the most glowingly exaggerated accounts of what they have seen in these mines, some putting at over $200,000,000 in sight. already blocked out in the mining depths by drifts, cross-cuts, and winzes, making Tonopah richer than a dozen Comstocks. Yet all they saw were naked walls to blindly guess at the value of, even measuring with a tape line on the same principle. All such sanguine estimates published, of vast blocks and extents of ore in sight are detrimental and misleading, and only fit to be put into prospectuses of wildcat mining companies interested in gulling the unwary.

The true criterion of mining valuation is the honest product, the bullion, not ore in sight. And gauged by the bullion product, the number of tons from which her silver and gold has been produced thus far, Tonapah makes a magnificent showing, needing no exaggeration.

Practical assays and milling tests have squarely proved the value of the vast resources of ore exported, and home reduction works will solve the whole rich problem in due time. Tonopah's best days are yet to come.

PRACTICAL MINING OPERATIONS.

Over 3 miles of underground work has been done by the main Tonopah mining company, a large part of this being in ore, working through three main shafts, the Siebert Valley View and the Desert Queen, the latter being used principally for the Tonopah Development Company, and all being connected underground. Every 100 feet drifts are being run on the ore veins and cross-cuts from the working shafts.

Winzes are also being sunk on the ledges to connect the various levels, and in this way the ore is being blocked out in good shape and the mine kept well ventilated.

It is simply impossible to estimate the amount of ore in sight, the drifts not by any means representing the real width of the ledges, as they vary from 1 or 2 to over 50 feet in width. The shafts and stations are all timbered in first-class style with Oregon pine timbers.

FIRST-CLASS MINING WORKS.

The large steel-hoisting works building contains a substantial 65-foot gallows frame over the main shaft, which most certainly is the best in the State, also a first-class hoisting engine driven by ample gasoline power; a 150-horsepower air compressor, and a large blower for supplying air down into the mining depths. Well-ordered machine shops are being added and, when fully completed, it will be a thoroughly first-class hoisting establishment in every respect.

All the mining operations of the company are being conducted throughout in the most careful, systematic, and substantial manner, and the great amount of work done, besides the extensive surface equipments provided, have all been paid for out of the proceeds of ore shipped to reduction works, together with the great cost of said shipments. And best and most satisfactory of all this, a handsome amount of money has accumulated in the treasury of the company. Indeed, this famous property is unique in having more than paid its way from the very start.

THE BELMONT TONOPAH.

Active development work is being done on the property of the Tonopah-Belmont Development Company, which lies directly west of the Tonopah Mining Company's ground. The Mizpah and Valley View ledges both run into it on the 614-foot level. The main ledge is as large and of as high grade in this property as anywhere in the Mizpah claim, and from the fact that the ore shoots all dip to the east and that the main ledges are converging toward the Belmont, the belief is prevalent that it will eventually prove to be the greatest property in the camp.

Another working shaft is being sunk 2,000 feet east of the present workings, with which it will connect in due time.

THE MONTANA TONOPAH.

Another very important property, immediately adjoining the main group of mines on the north, is that of the Montana Tonopah Mining Company. A series of half a dozen strong, high-grade ledges have been opened in its workings recently, which are nearly parallel to the Mizpah, and high-grade shipping ore is being extracted for reduction. This also bids fair to become one of the most valuable mines.

Immediately adjoining on the west is the Tonopah Midway Company's ground, in which has been opened up the same series of ledges discovered in the Montana, and high-grade milling ore is being extracted from them for reduction.

SOME MORE TONOPAH.

There are several other claims near camp which have recently developed high-grade ore, among them the Tonopah North Star, east of the Montana Tonopah Mining Company's ground. Good ore shipments are being made from it and it is expected that they will continue. It certainly is a very promising and valuable claim.

A very important ore discovery has also been made on the Grand Trunk ground, west of the famous buckboard claim of the Tonopah Mining Company.

On the south of the main Tonopah group the claims owned by the Gold Hill Mining Company, the Tonopah Fraction Mining Company, the Tonopah City Mining Company, and a number of other outside claims are about to be consolidated into a new company, to be called the Jim Butler Tonopah Mining Company, and active development will commence shortly.

STYLE OF REDUCTION WORKS DECIDED UPON.

No very extensive mine workings have been conducted below the 500, 600, or 800 foot levels of the mines, although shafts have been extended below 1,000 feet, also a diamond drill in the Mizpah mine, there being a vast abundance of rich ore already blocked out in the upper levels ready for lively extraction when required. Deep explorations are never necessary at present, there being ore enough opened out in the mines to run reduction works full blast, close at home, for the next few years at least.

Tonopah ore being of a somewhat refractory nature, not giving up its values readily, the company has had it worked by various reduction localities and processes in California, Washington, and lastly at Salt Lake. The object has been to find out and decide upon the best and most advantageous process of working the ore before constructing the extensive milling or smelting works required. This point is now said to be settled, and early in next year the machinery and equipments for the largest milling and reduction works ever erected on the Pacific coast is to be landed in Tonopah. Meanwhile, the Midway mill, now nearly completed, and perhaps two or three Kinkead mills, will be giving pointers on practical home-ore manipulation.

INCREASED WATER SUPPLY NEEDED.

Meanwhile a better water supply and more of it has to be considered and provided for. The present resources, springs and wells, within a few miles of town are ample for careful present use, but measures are being taken to largely increase the supply by sinking for deeper wells and well connections. The strong vein of water recently struck in the shaft of the Rescue Mining Company is engaged to supply the new Midway mill.

Tonopah has a good, lively fire department, with good machines, but when the town has its first baptism of fire—same as all other new towns—about next July, sweeping both sides of Main street and the other streets, it may be shown how difficult it is to check a big conflagration without plenty of water. The great project mentioned last year, of a powerful company formed to pipe in an abundant supply of water from Twin Rivers—70 miles distant—totally failed to materialize, leaving Tonopah to find her much-needed water nearer home.

TONOPAH RAILROAD CONSTRUCTION.

And now, last of all, comes the railroad. Its necessity commenced and stayed with the prosperity of Tonopah, and the route being only 60 miles long from the Carson and Colorado Railroad over a rolling desert country, it was thought that somebody would build it at once. A franchise for the road passed the last State legislature, and at one time the aforesaid railroad company threatened to construct it. Now, however, comes the solid business, the Tonopah Mining Company, with a straightforward proposition to ignore all others in that line and build the road on its own responsibility, breaking ground for it at an early date and completing the road in full running order early next season. This is as it should be, for the Tonopah Company best knows whether their mines will justify the construction of the railroad or not, independent of the Carson and Colorado Railroad or any outside assistance, thus speaking highly and well for the real merits and solid future prosperity of the mines and the district.

The true, substantial future prosperity of Tonopah will come in some time next year with the big reduction works and railroad.

NEW MEXICO.

By F. A. Jones, E. M., C. E., LL. D.

Field Assistant of United States Geological Survey, Albuquerque, N. Mex.

The work in collecting the production of the precious metals of New Mexico for the year 1902 has been carried out by personal inquiry and visit into every mining camp and district in the Territory. In many respects the results for the year in question are disappointing, but from a standpoint of scientific and intelligent mining and metallurgy which is now receiving the attention of operators generally throughout the more prominent camps, the outlook for the future is, indeed, very promising.

While the production of gold and silver will always contribute materially to the wealth of New Mexico, the real greatness of its mineral values lie in its extensive coal and iron deposits.

New Mexico is the cradle of the earliest operations of mining in the United States. It was here in 1541 that Coronado pushed his intrepid band of explorers across the burning wastes of sand to the traditional city of the Gran Quivira in search of the seven fabled cities of Cibola. He led this expedition as far north as Santa Fe, and his coterie of adventurers are said to have filled their packs with gold dust, nuggets, and turquoise, taken from the terror-stricken inhabitants of these ancient pueblos. From that time on New Mexico has contributed to the wealth of the world a goodly portion of the precious metals.

About 50 miles south of Santa Fe is situate the famous Ortiz mine, which bears the distinction of being the oldest lode mine in the United States. This mine, it is estimated, has produced several million dollars in gold, and has contributed, it is said, $1,000,000 in tithes to the early Spanish Church.

The vastness of the early workings of the Aztecs or Pueblos around the turquoise mines at Los Cerrillos, in Santa Fe County, and in the turquoise mines of the Burro Mountains in Grant County, is astonishing. These mines were worked, in part at least, before the advent of the Spaniard. Shortly after the possession of the country by the Spaniards, work was commenced on the famous copper mines at Santa Rita and Hanover, in Grant County, which are, without doubt, the oldest worked copper mines in the United States.

The value of the metallic production of New Mexico for the year 1902, consisting in the aggregate of gold, silver, copper, and lead was $1,489,016:

Metals.	Quantity.	Value.
Gold .... crude ounces..	19,465.82	$384,685
Silver, commercial value .... ounces..	285,485	148,659
Copper .... pounds..	7,979,167	860,737
Lead .... do....	2,490,915	94,935
Total	....	1,489,016

The distribution of production and results in the various counties of New Mexico are given in the following statement:

LODE OR DEEP MINES.

Counties.	Ore mined, 1902.	Ore sold or treated, 1902.	Stock of ore on hand.	
			December 31, 1901.	December 31, 1902.
	Short tons.	*Short tons.*	*Short tons.*	*Short tons.*
Bernalillo	9,194	8,399	7,288	8,083
Colfax	1,353	798	358	913
Donna Ana	415	90	2,415	2,740
Grant	55,110	40,804	106,447	120,753
Lincoln	23,500	6,400	6,000	23,100
Luna	1,955	1,851	5,610	5,714
Mora	250		300	550
Otero	1,960	414	214	1,760
Rio Arriba	750	58	1,143	1,835
San Miguel	4,375	40	475	4,810
Santa Fe	2,960	467	5,101	7,594
Sierra	5,824	1,588	17,077	21,313
Socorro	23,734	16,264	11,007	18,477
Taos	1,963		3,121	5,084
Valencia	10		10	20
Total	133,353	77,173	166,566	222,746

SUMMARY OF RESULTS.

Counties.	Gold.		Silver.		Copper.		Lead.	
	Crude ounces.	Value.	Cude ounces.	Value.	Pounds.	Value.	Pounds.	Value.
Bernalillo	2,144.51	$44,182	35,427	$19,746	1,000	$110		
Colfax	172	3,552	73	38				
Donna Ana	164.35	3,400	192	100			9,950	$400
Grant	3,807.89	78,710	48,513	25,125	7,251,757	793,028	464,840	18,162
Lincoln	2,448.28	50,607	11,520	6,009				
Luna			10,382	5,416			711,825	28,275
Mora								
Otero	154.80	3,200	146	76	117,520	11,732		
Rio Arriba	21.80	452	5,807	3,030	5,740	798		
San Miguel					3,500	315		
Santa Fe	306.74	6,341	1,808	945	3,250	390	32,131	1,294
Sierra	1,049.81	21,705	25,114	13,096	56,400	5,728	82,965	3,315
Socorro	2,029.47	42,056	146,503	75,078	540,000	48,636	1,189,004	43,489
Taos								
Valencia								
Total	12,299.65	254,205	285,485	148,659	7,979,167	860,737	2,490,915	94,935

PLACERS (GOLD).

Counties.	(Crude). ounces	Value.
Colfax	6,497.60	$117,680
Grant	192.35	3,665
Lincoln	28.52	550
Otero	14.40	275
Rio Arriba	6.40	115
Santa Fe	112.18	2,145
Sierra	309.58	5,950
Taos	5.14	100
Total	7,166.17	130,480

SOURCE OF PRODUCT.

	Crude ounces.	Value.
Gold:		
From quartz	12,299.65	$251,205
From placer	7,166.17	130,480
Total	19,465.82	384,685
Silver:		
From quartz	183,385	95,876
From copper ores	54,171	27,851
From lead ores	47,929	24,932
Total	285,485	148,659

	Fine ounces.	Value.
Gold:		
From lode (quartz)	12,296.166	$254,205
From placer	6,311.970	130,480
Total	18,609.136	384,685
Silver: From lode (quartz)	285,006	148,689

BERNALILLO COUNTY.

Bernalillo County, in 1901, ranked first as a gold producer in New Mexico, the bulk of the product coming from the Albemarle mine in the Cochiti mining district. This mine closed down in the early part of 1902 and has been idle since. The cause of closing was due to a decrease in values at greater depth, which rendered further work unprofitable. The extraction of the gold was accomplished by cyaniding.

The plant is said to be the largest and best equipped of any in the Territory. The production of gold and silver in Bernalillo County for 1902 is almost wholly due to the Albemarle mine during its operation in the early part of the year before its closing down.

There are some other properties in the Cochiti district which are promising and may become producers of considerable note when further developed.

The Placitas and Sandia districts are comparatively new, but give promise of considerable copper in the near future. Some gold, silver, and lead values are also found associated with the copper. So promising has been the outlook of this section that a smelter is now in course of erection at Algodones on the Atchison, Topeka and Santa Fe Railroad, on the Rio Grande, under the supervision of A. J. Frank, an experienced mining man.

The 10-stamp mill and cyanide plant at Woodbury, which was constructed in the early part of 1902, was operated only a short time until it closed down. The ores treated were from the Cochiti district.

COLFAX COUNTY.

This county produces the principal output of placer gold in New Mexico. These extensive placer deposits encircle the foot and slopes of Baldy Mountain. The Ponil Park, Ute Creek, Willow Creek, and Moreno comprise the district around Baldy.

The most noted of these camps is the Moreno district on the west side of the mountain at Elizabethtown. Gold was first discovered at Elizabethtown in the early sixties, and the camp has been a large producer ever since.

The famous Lynch ditch, which was constructed immediately after the discovery of gold at Elizabethtown, has done much toward the development of those placers. The ditch is something like 40 miles in length, and diverts the waters of the Red River to the placer fields of the Moreno Valley. This ditch passed out of the Lynch Brothers' hands a few years ago, and is not now in good repair.

The principal hydraulic mining is now done by Joseph H. Lowery, at Elizabethtown, and Herman Kaiser, in Willow Creek gulch.

The most important achievement in successful handling of the placers of the Moreno Valley was the construction and operation of a dredge by H. J. Reiling, of the Ore Dredging Company. This dredge is in the Cimarron River, about 1 mile south of Elizabethtown and is working out the bed of the stream to 300 feet or more in width and to a depth of 20 feet from the surface. It is to be noted that this dredge is producing over 28.2 per cent of the entire output of gold in New Mexico. It is conservatively estimated that at least $30,000,000 yet remain in the placer grounds surrounding Baldy Mountain.

The Aztec, a lode claim on the east side of Baldy Mountain, has been a famous producer, and has the credit of producing over $2,000,000, is now practically idle, on account of litigation.

It may be said that the placer mines of Colfax County are practically the only successful producers of gold, inasmuch as the lode mines contribute very little toward the production of the county.

DONNA ANA COUNTY.

This county made a substantial gain in the production of the precious metals in 1902 over that of 1901. The Organ and Black Mountain districts are the most important mining camps in this county. The pneumatic dry concentrating plant, erected in 1902, at the Modoc Lead mine, did not prove successful, and is at present inoperative.

The Torpedo mine, a copper proposition, is getting into shape by having its lower levels pumped out, after having been idle for over a year. This mine, in 1900, was a heavy producer, and promises now to add materially to the production of Donna Ana County in 1903. The Bennett mine is also getting in line after a period of some two years of idleness and promises to increase its production in 1903 over that of 1901. It is expected that Dona Ana County, especially in the Organ and Black Mountain districts, will make a splendid showing for 1903.

GRANT COUNTY.

This county is the banner county of New Mexico, so far as activity in mining and mineral output are concerned.

This county has contributed to the Territory's mineral resources more than any other county. During 1902, however, there were several causes of a falling off in production from what was expected, due to matters unforeseen and wholly unavoidable.

The closing down of the Silver City smelter after it passed into the control of the American Smelting and Refining Company and, more recently, it being destroyed by fire, has had a depressing effect throughout the adjacent mining camps, since most all the ore produced in that vicinity was treated at this plant.

The Comanche Mining Company, which owns valuable copper property in the Burro Mountains, purchased the Silver City smelter from the American Smelting and Refining Company and was arranging to blow the same in when it was burned down. The Comanche Company intend, it is learned on good authority, to rebuild the plant.

The slump in copper also naturally decreased the activity in mining the same, which also, correspondingly decreased the gold and silver production.

The Shamrock Smelter recently began operations at the Silver Cell mine, and is not only smelting the ores from the Silver Cell, but is also doing a good custom business from the ores about Pinos Altos, Central, Hanover, and Santa Rita.

Much activity is being manifested in the Pinos Altos district, and it promises to get back shortly to its pristine glory of being one of the heaviest gold-producing sections in New Mexico. The placers in this camp continue to be worked, though mainly by Mexican labor.

The rich gold strike recently made by A. A. Hamilton, in Gold Gulch, at Central, has caused a rush and revival in that camp which has been on the decline for several years. The extensive operations of the Colorado Fuel and Iron Company, at Fierro, on the immense iron deposits at Fierro, places Grant County in the front ranks of the production of iron.

Among the most prominent mining properties in Grant County is the famed copper mines of Santa Rita. These mines are operated continuously and produce the bulk of the copper of the Territory. There are many thousands of tons of low-grade ore on the dumps which is being worked continuously by a 50-ton concentrating plant. These mines, as previously mentioned, were the first copper mines worked in the United States.

The Apache mine, in this county, lying a few miles to the southeast of Hachita, is a steady producer of copper, carrying values also in silver and gold.

The new line of railway, the El Paso and Southwestern, is causing an awakening in mining in the immediate country through which it passes.

The lead mines at Granite Gap are also steady producers, and produce the finest grade of smelting ore of any camp in New Mexico.

Near Lordsburg, at Gold Hill and the Virginia districts, much substantial development work has been done, and some of the properties are beginning to ship. The ores in the Virginia district are principally sulphide ores and copper, carrying some values in gold and silver, while the ores at Gold Hill are principally free milling. Mr. Frank G. Cline is operating a 5-stamp mill and cyanide plant with good success at the latter-mentioned camp. Grant County, as a whole, has much to recommend it as a successful mining county.

LINCOLN COUNTY.

The Old Abe mine, a famous gold producer at White Oaks, is down to a depth of 1,350 feet and is perfectly dry. This mine has the reputation of being the deepest dry mine in the world. The Old Abe changed hands some months ago, and now belongs to the Eagle Mining and Improvement Company.

Aside from the White Oaks district, the Nogal and Jicarillas are rapidly attracting the attention of investors, and much permanent work is being done in these two camps.

LUNA COUNTY.

Cooks Peak is the principal district in this county which is strictly a lead camp. This camp has been producing for many years, and will yet likely be a healthy producer for some time to come. The principal property of this camp is the Desdemona mine, belonging to the Consolidated Kansas City Smelting and Refining Company, now controlled by the American Smelting and Refining Company. This property is now worked under lease by W. C. McDermott.

The Faywood Lead Company are building a dry pneumatic concentrating plant on the opposite or northwest side of the mountain from Desdemona. There appears to be a very large body of low-grade galena ore at this point, and if the pneumatic plant proves a success there is enough ore to keep the plant busy for years.

The lack of water at Cooks Peak is a serious obstacle in the working of those mines. The Florida and Tres Hermanas districts are also, as Cooks Peak, lead camps.

The Hetty group of claims, owned by A. J. Clark and associates, in the latter district, is in a fair way of greatly augmenting its present output in the near future. Luna County, so far as present development has demonstrated, is strictly a lead-silver county producing but little gold.

MORA COUNTY.

This county has never been a producer, and can scarcely be classed as a mineral county, although some very promising copper prospects have lately attracted the attention of some of the local prospectors.

OTERO COUNTY.

The Three Bears is the principal producing group of this county at present. Much capital for development has of late gone into the Jarilla camp, which is making a splendid showing. The Jarilla district gives promise in general of large deposits of sulphide ores of lead and copper which carry good values in gold and silver.

The Nannie Baird and Lucky mines have already produced considerable shipping ore, and no doubt will eventually become steady producers.

Some production in placer gold has been reported from this district for several years.

The celebrated turquoise mines of De Meules are also situated in this district, which have produced many pretty and valuable gems.

RIO ARRIBA COUNTY.

The mining districts in this county are rather remote from transportation, excepting the Bromide district. This district is by far the most thoroughly developed one in the county. Most of this development has been done during the past year. Although not a shipping camp, it gives every assurance of considerable production in copper at an early day.

The Bromide mine, from which the camp took its name, was operated some during 1902, and made a good showing with profitable results during the short interval it was worked. The exacting of too much royalty by the owners from the lessees has caused this property to close down.

Extensive operations are now being made to work the placer fields at Hopewell, which is thought will be made a success.

The remoteness of the Hopewell district from transportation renders this camp nonproducing at present, although splendid sulphide ores carrying good values in gold, silver, and copper are found throughout the camp.

SAN MIGUEL COUNTY.

The principal mineralized district in San Miguel County is adjacent to the town of Las Vegas. The mineralized zone is in a sandstone blanket deposit and extends over a large area. The mineral is malachite, and permeates a certain stratum of sandstone, having been deposited from solution by the leaching out of some older deposits.

The grade of this ore is very low, averaging about 3 per cent copper.

Two mills for experimental purposes are now in course of erection for the purpose of leaching this ore with sulphuric acid and saving the product as bluestone. Should the process of working this ore prove successful, these small experimental plants will be immediately enlarged to a capacity of 100 tons or more. Enough of this ore is in sight to keep the mills running steadily for many years to come.

The outcome of these two experimental plants will be closely watched by those who are directly interested in these extensive deposits.

This county as yet has contributed but little to the mineral wealth of the Territory, aside from the beautiful building and flag stones, which are without a parallel in New Mexico.

SANTA FE COUNTY.

This county bears the name of the celebrated city which it contains. The mere mention of Santa Fe carries us back over three and one-half centuries and associates the avaricious Spaniard with the golden ornaments and turquoise gems of the ancient Pueblos. It was, perhaps, in this county that the first mining operations were conducted in the United States.

The rich placer fields at Dolores, in the Ortiz land grant, at Golden and at San Pedro, have been worked for at least three centuries by the Pueblos and Spanish explorers. The amount of gold taken from these placers prior to the year 1860 will never be known, although it is safe to assert that it reached into the millions. The large smelting plant of the Santa Fe Gold and Copper Company near San Pedro suspended operations in the latter part of 1901, which has greatly reduced the production of gold and silver in Santa Fe County. The closing down of this plant was due to the slump in copper; it is not known when operations will be resumed.

The Los Cerrillos district is picking up of late, since the completion of a 50-ton lead and copper stack smelter at the town of Cerrillos. The ores are heavy lead sulphides, and contain in many cases too much zinc to be profitably treated without first making a separation from the latter metal. However, the district is doing much work of a permanent character, and good bodies of ore are frequently encountered where the zinc is not a menacing factor.

There are some good bodies of iron ore north of San Pedro, which will no doubt become valuable as a fluxing ore in the very near future, since the completion of the Santa Fe Central Railway places this iron only a few miles from transportation. The anthracite coal field at Madrid, operated by the Colorado Fuel and Iron Company, tends to place Santa Fe County as one of the most substantial mining counties of New Mexico.

SIERRA COUNTY.

Before the demonetization of silver this county was the principal producing county of the white metal in the Territory. Of late years those famous silver mines—the Lady Franklin, Calamity Jane, Illinois, Brush Heap, and Polomas Chief, and others, around Kingston, the Silver Monument, of near Chloride, and the Lake Valley mines—have been practically idle.

The principal gold camp of Sierra County is Hillsboro, in the Las Animas mining district. Both placer and lode gold are mined in considerable quantities at Hillsboro. The Mexican element work the placers, while the lode mining is being done by Americans.

The Sierra Consolidated Gold Mining and Milling Company have recently acquired a group of many of the principal mines around Hillsboro, including the Snake and Opportunity mines, which formerly belonged to Henry M. Porter, of Denver, and are now doing extensive development and placing new machinery on the property. No doubt the production of gold and silver will be greatly augmented in 1903 from this camp by the operations of this syndicate.

Sierra County is badly in need of transportation facilities since it is not touched by any railway excepting that of a branch to Lake Valley, built by the Atchison, Topeka, and Santa Fe Railway at the time of the great silver strike at the Lake Valley mine of the famous Bridal Chamber. This great silver find was on a parallel with the famous Mollie Gibson mine of Colorado.

SOCORRO COUNTY.

Next to Grant County in production, Socorro County takes rank. This is a very extensive county, and covers more area than the State of Massachusetts. Cooney mining district is the best copper and gold section in the county, while the Magdalena district leads that of any other in the production of lead. The Silver or Cooney Bar mine, now owned by the Mogollon Gold and Copper Company, has been a noted producer, but with the erection of a 50-ton wet-crushing concentrating plant it bids fair to become the greatest producer of any mine in Socorro County during 1903.

The Maud S., Last Chance, Little Fanny, and B. O. B. mines have been or now are heavy producers. The Confidence mill and mine at Graham closed down in the early part of the season of 1902, and the same has been idle since, owing to the death of its manager, J. T. Graham. This latter plant is run by water and electricity; it is 100 tons capacity, wet crushing by stamps, settlers, and pan amalgamation.

Socorro County is possessed of extensive fields of coal and iron. The present workable coal is at Carthage, about 10 miles east of San Antonio. The deposits of iron in the Jones mining district, about 18 miles west of the El Paso and Northeastern Railway, are the most extensive in New Mexico. The Graphic mine of Magdalena is the most noted lead mine in New Mexico. It also contains heavy sulphides of zinc, as well as large bodies of smithsonite. These zinc ores are now for the first time receiving attention from the operators, Messrs. Fitch & Brown, and the Graphic mine will no doubt achieve distinction as a zinc producer within the coming year. The Kelly mine adjoins the Graphic, and has been a steady producer for nearly a quarter of a century. Cat Mountain district has just completed a 50-ton stamp and concentrating mill and has recently started the same up, and from all reports a heavy producer of gold may be expected from that section in 1903.

TAOS COUNTY.

The erection of a 50-ton cyanide plant on the Rio Grande at Rinconada, by the Glen Woody Mining and Milling Company, which will be in operation about September 1, 1903, is destined to mark a special feature in the future production of this isolated county. The Rio Grande, through a Pelton wheel, will furnish the power for running this well planned and devised plant, and doing all the mining. This mine is to be regarded as a second Homestake, since there is a veritable mountain of low grade gold ore, running on an average from $2.50 to $3 per ton. Enough ore is in sight to keep a mill of 500 tons capacity going for at least fifty years. This plant will be increased just as soon as it is shown that a 50-ton plant is a success.

The Fraser Mountain Copper Company have recently installed a 50-ton concentrating and smelting plant to treat the low grade copper ores in the schistose slates, at Twining. This plant is on the eve of starting. The Red River district is somewhat reviving, since the 10-stamp mill at the Jay Hawk mine is about ready to begin operations.

This district has many commendable features concerning it; plenty of mine timbers, water, and great bodies of low grade sulphide ores of copper and lead carrying gold and silver. It, however, is almost inaccessible, and is so far away from transportation that it will likely be some years before mining can be done on a big scale and at a profit.

The La Grande Gold Mining Company, under the supervision of J. P. Rinker, is getting in readiness to build a dredge to ply on the Rio Grande and work the auriferous sands in the bottom of the stream.

It is estimated that many million dollars of fine gold lies in the bed of this river, which can be successfully worked by a dredging machine.

VALENCIA COUNTY.

At the present time Valencia county has nothing to recommend it as a metal-producing county, as only 10 tons of low-grade ore were mined during 1902. There are, however, some promising looking prospects of copper in the south end of the Manzano Mountains which may eventually develop into something more than a prospect.

CONCLUDING REMARKS.

While the production of the precious metals for 1902 in New Mexico is disappointing as compared with that of 1901, it is nevertheless a fact that mining is on a healthier basis, and more money is being spent in permanent improvements and in the installation of machinery, which is better adapted to the metallurgical treatment of the various ores, than has ever been done before in the history of the Territory.

The data for comparison of the production by counties of 1901 and 1902 is not at hand. The falling off in production in Bernalillo County is due to the closing down of the Albemarle mine; that in Santa Fe County to the closing of the plant of the Santa Fe Gold and Copper Company, and that in Socorro County to the suspension of work at the Rosedale mine. The first two mines were heavy producers in both gold and silver, while the Rosedale mine was strictly gold.

On the other hand, Colfax County has made substantial gains which are likely to remain permanent for several years, solely due to the installation of the big dredge of the ore dredging company. There were also some gains in the production of the precious metals in the counties of Donna Ana, Grant, Sierra, and Rio Arriba.

On the whole, mining in New Mexico is to be regarded as being in a most satisfactory condition, with a stable outlook for the future.

OREGON.

By Frederick A. Wing,

Assayer in charge United States assay office, Seattle, Wash.

The output of Oregon's gold and silver producing mines for the year 1902, compiled from the reports of the several mints, assay offices, custom refineries, and smelters of the United States and British Columbia, is as follows:

Metal.	Quantity.	Value.
Gold........fine ounces..	88,884.501	$1,837,405.70
Silver (coining value)........do....	109,462.78	141,527.62
Copper (at $11.626 per hundredweight)........fine pounds..	13,736.00	1,596.95
Lead (at $4.069 per hundredweight)........do....	29,100.00	1,184.08
Total........	....	1,981,714.35

By referring to the appended table, the increase in gold will appear to be very inconsiderable, only 125 fine ounces, while it exceeds that of 1900 by 5,318 fine ounces. This demonstrates the fact that there is a gradual gain being made in the production covering any given period, but that it is never in like ratio from year to year.

Some mines yield well one season and cease to produce entirely the next, while others, having been idle for a time, will start again with new equipment, increased facilities, or new management, and fill the breach caused by the temporary suspension elsewhere. The greatest loss is in silver, there being a falling off of $70,349 compared with 1901, which arises largely from changed characteristics in some of the ores treated, showing increasing values in gold and a corresponding decrease in silver values.

Production of Precious Metals in the State of Oregon during the Calendar Year 1902 Compared With That of 1901.

Metal.	1901.		1902.	
	Quantity.	Value.	Quantity.	Value.
Gold........fine ounces..	88,759.473	$1,834,821.15	88,884.501	$1,837,405.70
Silver........do....	163,873.41	211,876.73	109,462.78	141,527.62
Copper........fine pounds..	25,462.00	4,103.71	13,736.00	1,596.95
Lead........do....	37,650.00	1,631.50	29,100.00	1,184.08
Total........	....	2,052,433.09	....	1,981,714.35
Net decrease........	....	....	....	70,718.74

The event of primary interest for the year to mine owners of the gold belt of the Blue Mountains, or at least to those in and about Sumpter, was the construction of the smelting and refining plant at that point by the Oregon Smelting and Refining Company. The erection of this plant, right at the doors of many of the best producers, means a great saving in way of transportation charges, and marks the dawning of greater prosperity. It is largely due to the enterprise and persistent effort of such men as Hon. J. H. Robbins, Seymour H. Bell, W. D. B. Dodson, and other Sumpter capitalists and business men that this camp is taking such a prominent part in Oregon's mineral development.

Unlike many districts, those of eastern Oregon are vast in extent, reaching as they do fully 130 miles, from the John Day Valley on the west to the Snake River on the east, and the mineral zone is fully 20 miles in width. When one takes into account the fact that scattered here and there throughout this portion of the State many prosperous camps have been long established, that new ones are constantly being formed, and that already millions have come from its mines, the importance and magnitude of the gold belt of eastern Oregon as a great factor to be taken into account in wealth producing becomes more and more apparent. In many portions of the territory comprising this zone large bodies of low-grade ores are known to exist, as for instance those near Malheur. The Black Eagle mine is located on one of these immense porphyry dikes, miles in extent, from which eventually great wealth will come. They have a 20-stamp mill in operation, and are contemplating increasing it at once. This is more of a quarry than a mine, in the generally accepted sense, as they simply quarry it out, as has been done for years in the great Treadwell mine of Alaska. Some of the ore bodies in other sections are rich and massive and continuous, those in the Cracker Creek district, for instance, the one on which the Golconda, Columbia, North Pole, E. & E., and South Pole mines are located. These are all on an immense lode, averaging in width, as shown by the crosscuttings, from 80 to 100 feet, and its depth can be judged by the levels shown in the Columbia and North Pole. While "faults" are found occasionally, there are none sufficiently pronounced to convince one that this is not a continuous vein nearly 15 miles in length. The Golconda has added 10 stamps to its equipment, throwing out the old bromo-chlorine plant; the North Pole has built a new cyanide plant, and other changes along the line of better facilities are in evidence all through this portion of Oregon's mining section.

The North Pole was the heaviest producer for the year. Improvements have lately been added, giving the mill for handling free ore a capacity of 140 to 150 tons per day. The aerial tram has been extended, a cyanide plant for the handling of tailings erected, water-power increased, concentrating and dumping tables added, and other improvements made that will increase the treating capacity and introduce economies into present methods. The North Pole mill now has 30 stamps. The concentrators for these batteries, 12 of which were recently added, are ample to save all values passing the plates. The cyanide plant has nine 24 by 6½ cyanide tanks and 6 agitating tanks. The theory of this treatment is to handle the coarse sands and slimes separately. The tailings all pass to the 9 tanks first, where the slimes are allowed to pass to the agitating tanks with the overflow and treated by the latest process. The former 8,000-foot aerial tram has been supplemented by an aerial line from the northern terminus, which is at the mouth of tunnel No. 1, to the upper tunnel, a distance of 2,500 feet. The buckets of this system carry 250 pounds each and are attached at every 100 feet of the traction cable. The speed of delivery will be much more than sufficient for the requirements of the present stamp mill and involves a cost of but a few cents per ton for transferring ore from the mine to the treating plant. In all respects the North Pole mill is now the best in the district. It is commodious, arranged with mechanical accuracy and economy, will treat a large quantity of ore, and may be made to handle a far greater amount of ore by simply adding to the battery.

The Bonanza is putting in a deep sinking plant and is down 1,000 feet with its triple compartment shaft and doing good work, but producing very little, as they are developing.

Golconda's new 20-stamp mill was started July 6, having discarded the old bromo-chlorine system, and late in December they struck in the vein from the 200-foot level 2 feet of ore, valued from $124 to $128 per ton. The ore is in the form of rich sulphurets. They have installed a new hoisting plant during the year, and there is an appearance of thrift and prosperity about the mine.

One of the most interesting mining propositions in northeastern Oregon, from the nature of the ore being treated, is that of the Standard Consolidated, in the Quartzburg district. The ore runs high in cobalt, shipments of which have been sent abroad, finding a ready market among the larger dyeing houses of Germany. I quote from the report furnished me by the general manager of the properties mentioned, Doctor Mueller, to whom I am indebted for many facts of interest relative to the mining conditions in Oregon. He writes as follows:

SUMPTER, OREG., *July 6, 1903.*

DEAR SIR: With reference to your inquiry as to the facts of a scientific interest from the Standard Consolidated Mines, I would say that there are on this property, which is located in what is known as the Quartzburg district of the Sumpter gold fields, two systems of veins. The one is chiefly a gold-bearing system, having only small silver values and, occasionally, a trace of copper or zinc. This system has a north and south strike and is practically perpendicular.

There are three veins on this system: The Last Chance, very little developed, showing a width of 1 foot to 18 inches, has produced some very high-grade ore showing free gold. Two pockets of this vein produced, respectively, $7,000 and $9,000. Parallel with this is the Cleveland-Willie Boy, having a width of 4 feet. This vein has been more developed, considerably more ore having been taken from surface work and treated in an old arrastra. The values, taking average of the several shoots, run something better than $20. The gangue of this, as of the other veins of this system, is quartz with sulphurets, and the values are associated with the sulphurets. The shoots of this vein seem to be of great length, the ore is partially free-milling, and for the rest a simple concentration proposition. Parallel with this vein, but cutting the crest of Copper Mountain, yet belonging to the same system, is Pinkerton Ledge. This seems to be very wide, about 8 feet, but the values are lower—running between $6 and $8. Very little development work has been done on this vein, but surface cuts have opened up the vein in numerous places. The chief scientific interest, however, I believe, is in the system of veins which cuts diagonally across the system of veins just mentioned. This cross system has a strike of northeast and southwest. There are four veins of this system on the property which have been partially opened up. They all seem to converge near the top of Copper Mountain. This system is of more recent date than the one first mentioned, as is shown by the persistency of these veins where they cross the other system.

The second system carries more base metals. All of them carry copper, gold, and silver. They vary in width from 2 to 8 feet, but the one principally developed and typical of the system is what is called the "Standard Vein." This seems to be a fissure zone some 70 feet in width, carrying lenses of very high-grade ore, which attain a width of 6 or more feet. Considerable development work has been done on this vein, and here was first found in large deposits the cobalt ore in the form of an arsenide, probably smaltite. Wherever the cobalt seems to be most in evidence the gold values also increase.

The composition of the ore from this vein is quite complex. One analysis, for instance, shows about 18 per cent cobalt, 7 ounces of gold, 4½ per cent copper, 23 ounces in silver, and one-half per cent nickel. Some pyrrhotite is in evidence, and I think the nickel is to be found in this. A recent analysis of some of the spice made in a small smelter on the ground of the company, shows that there is also platinum in the ore. Analysis of some of the shoots show this platinum to be associated with the copper ores. It seems to exist in commercial quantities. The metallurgist of the company is at the present time making further, more careful analyses of the ores to determine the extent of the platinum in them. Other of the rare metals are also suspected. The analysis given above with the high precentage of cobalt is, of course, not representative of all the ores, as the vast bulk of the ore is of considerably lower grade and requires concentration. Some of the ore has been concentrated in an old mill, and it has been demonstrated that the cobalt can be separated from the iron and copper because of its greater specific gravity, and that then, further, the copper which occurs in sulphide form can be fairly well separated from the waste product, thus forming two concentrates. The cobalt concentrates run very high in gold values, as well as in cobalt; copper concentrates—about 30 per cent copper; about $60 in gold; about 37 ounces in silver, some nickel and platinum. Of course all the cobalt is not separated from these copper concentrates.

Copper Mountain seems to be the center of a mineralization as the veins seem to radiate from near the top of the mountain as do the spokes of a wheel. Considerable interest will be attached to the development of this property. The development outlined seems to be of such a character as to insure the earliest and most approved demonstration of resources.

I trust this may answer your inquiries.

Sincerely, yours,

Oregon Smelting and Refining Company,
E. W. Mueller, *General Manager.*

Mr. Frederick A. Wing,
United States Assay Office, Seattle, Wash.

Not so much work was done on the Cougar, at Granite, during the season. The only prospective activity in this section is centered in the Independence, which, under new ownership, will be developed at once.

The Black Pine placer properties were working during the season whenever they had sufficient water. A survey has been made for a long ditch to increase the present force of 100 inches to more than 300, with much better head.

The managers of the Empire Company have been very reticent as to the *results* of their operations on the John Day River, failing to respond to our inquiries. However, the statement that the working of their dredger, the first of the New Zealand type ever tried in the district—"has been satisfactory"—must suffice, as that seems to be all they care to say for publication.

In the Cornucopia district very little in the way of production was consummated during the year. New parties have taken hold of the Mayflower. They are driving a new tunnel to strike the ledge at a lower level, hoping to demonstrate the depth of the vein, which lower down on Last Chance is well defined down to 400 feet. This would give the Mayflower some 600 or 700 feet of depth.

The mines of southwestern Oregon have maintained their reputation as producers this season, notably the districts in Douglas and Lane, Jackson and Josephine counties. The largest output came from the Greenback, with Gold Bug a close second. Many others have reported satisfactory results and the placers have contributed largely to the grand total of the State's mineral wealth. While the totals of gold and silver show a small decrease over 1901, the loss has been entirely in silver. A gain of $2,584 in gold is shown by comparison.

Baker County easily ranks first in gold production, Josephine second, while Grant leads in the amount of silver produced during this as in previous years.

The placers of southwestern Oregon have always been of interest to mining men from the peculiar freaks of nature so often encountered.

One of these unusual deposits is that of the Allen Gulch placers, operated and owned by Seattle parties. The peculiar conditions existing there are intelligently described in a letter which I submit herewith:

Mr. F. A. Wing,
United States Assay Office, Seattle, Wash.

Dear Sir: In reply to your request for information regarding the Allen Gulch placer mine, near Waldo, Josephine County, Oreg., I inclose the following: The gold product is, as you know, different from that of any other placer. No one to whom it has been shown has seen placer gold in like shape, form, or color, a large part of the product resembling rolled oats, or flaked wheat, in shape and thickness, colored brown with oxide of iron. Under the microscope the color is seen to be given to an envelope of silica, completely covering the inside scale of gold, which, when the covering is broken, is shown to be uniformly pebbled upon both sides, presenting no appearance of being channel or water worn. It is of a greenish, very light yellow color, and carries very little alloy, it ranging in value from $19.10 to $19.2975 per ounce. Associated with this rusty appearing scale gold are fine bright particles of gold which readily amalgamate.

My belief is that the scale gold was precipitated from solution on coming in contact with iron after the gravel deposit was complete, and probably after the river had ceased to flow, as it never has been subjected to movement in the river bed. No nuggets or channel-worn gold have been found in this mine. The covering of silica, by reducing its specific gravity, makes it difficult to save in the ordinary way.

The channel is from 40 to 85 feet deep, and about 1,500 to 2,000 feet wide, is located upon the top of a spur of the Siskiyou Mountains, which, jutting out in a northerly direction from the main range, some 10 or 12 miles south, forms the divide between the east and west forks of the Illinois River. These unite a few miles north of Waldo. This spur gradually decreases in elevation, ending in the valley about half a mile north of the mine, the elevation of the mine being about 300 feet above the Illinois River. There are no indications that any other part of this—which was probably an old cretaceous river—yet remains; the disintegration and reconcentration of its other portions was undoubtedly the source of a large part of the gold distributed in this locality and which has been taken out of the gulches leading to and now being mined from the bars of the Illinois River. Some of the gulches, notably Allens, Scotts, and Sailor gulches, were very rich, producing in the early fifties large amounts of gold, this product being credited as part of the output of California. Associated with gold here is platinum, iridosmine, and iridium, all of which is water-worn and smooth, indicating a different origin. The channel is locally called "rotten bowlder formation," for the reason most of the bowlders easily break at a blow, and on exposure to the atmosphere crumble and disintegrate. The bed rock, although reasonably hard when first uncovered, also disintegrates on exposure. It is everywhere seamed and cross seamed with quartz stringers, also decomposed. The gravel in the channel above carries many quartz seams, showing that at some time in its history it must have been very solidly cemented, as the fracturing in the bed rock was continued up through the channel directly through the hardest bowlders and as clean cut as though solid rock, these fractures being subsequently filled with silica, the widest quartz seams we have met in the gravel being about 6 inches. This occurrence of quartz seams in gravel is said to be unusual. There are a number of other high channels in this section, some being at least at an elevation of 1,000 feet higher than this. Gold found in all of these is nuggety and water-worn, the character of each being dissimilar. One nugget was found on Althouse Creek weighing 17 pounds avoirdupois. Other mines on the lower levels, near Waldo, are the Simmons & Cameron and the Deep Gravel Mining Company, both of which have been in continuous operation for many years. On account of the water supply the mines can only work from five to seven months during the winter and spring.

Trusting this may be of some interest to you, I am,
Very truly, yours,
F. H. Osgood.

The Greenback quartz mine, on Grave Creek, Josephine County, was originally called a pocket ledge, the discoverers putting an arrastra upon it, and taking out many thousands of dollars. After having, as they thought, worked it out, it was sold for a small sum to the present owners, who installed a 5-stamp mill upon it. Each year additional stamps have been added, 10 having been put in the last year, making 40 in all. As depth is attained the ore is said to increase in value and the veins in size. The property is owned as a close corporation, and is believed to be a very good paying mine. This property is interesting as showing that the so-called pocket veins in southern Oregon do go down, and that development will prove many of them to be paying mines. The 150-ton cyanide plant recently completed at the mine is now in operation, placing the Greenback among the foremost quartz mines of the State. In 1898, when the mine was purchased by Smith & Moffat and other Colorado men, it was a mere prospect hole; thus it has grown to its present proportions in about five years. The mine is tapped to a depth of 900 feet, and there are said to be 100,000 tons of ore in sight which will average $16 a ton.

It is expected that, with the present equipment, the plant will crush 3,000 tons of ore each month. A peculiar feature of the Greenback vein is the fact that it carries free gold at great depths, flakes of pure gold being found even at the 900-foot level.

The Granite Hill mines, lately bought by Spokane or Idaho parties within the last few months, situated south of the Greenback on Louse Creek, are being opened up. The showing is said to be very good. The producing mines reporting are as follows:

BAKER COUNTY.

Flick Bar Mining Company and Clarke Creek Mining Company, Baker district; Never Sweat placer mine, Pocahontas district; Chicken Creek placer mines, Baker City; French Gulch placer mines, Auburn district; Black John placer mines, Burnt River district; Nelson placer mine, Baker City; Virtue Consolidated mines, Baker City; Eagle Mines Company, Cable Cove district; Monster Gold Mining and Milling Company, Bridgeport district; Eastern Oregon Mining Company, Cracker Creek district.

COOS COUNTY.

Salem Bar placer mine, Johnson Creek district.

DOUGLAS COUNTY.

Little Chieftain Mining and Investment Company, Myrtle Creek district; Cains Mining Company and Lewis Ash mine, Excelsior district.

GRANT COUNTY.

Wilson Bros. mines, Susanville district; Hoosier Boy Gold Mining Company, Great Northern Mining Company, and Windless Gulch Mining Company, Marysville district; Old Dixie mine, Dixie Creek district; Welch & Briggs, Susanville; Elk Creek Placer Mining and Water Company, Susanville; Quartz Gulch Mining Company, Canyon City; Black Butte Mining Company, Pendleton, and Badger Gold Mining and Milling Company, Susanville.

JACKSON COUNTY.

Bank of Ashland, Ashland; Little Frenchman mine, Foots Creek district; Howland & Cook mines, Jump Off Joe district; Lance Bros. mine, Rockpoint; Lone Star mine and Vroman mine, Pleasant Creek district; Hosmer, Anderson & Co., Foots Creek district; Pearce placer mine, Jacksonville, and Willow Springs mines, Central Point.

JOSEPHINE COUNTY.

Savage & Miller placer mine, Davidson; Gold Drift Mining Company, Dry Diggins district; Golden Wedge mine, Galice district; Horsehead mine, Murphy; Gold Bug Mining Company, Glendale; Treasure Trove mine, Applegate district; Mountain Slide Placer mine, Althouse district; Vindicator placer mine, Saunders placer mine, and Ruble Hydraulic mine, Wolf Creek district, and Greenback gold mine, Greenback district.

LANE COUNTY.

Lucky Boy Mining Company, Blue River district.

MALHEUR COUNTY.

Eldorado Ditch and Mining Company, Baker City; Willow Creek Mining Company, Huntington, and Homestake mine, Malheur.

Production of Gold and Silver in Oregon (Origin Detailed) during the Calendar Year 1902.

Origin.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Value.	
	Fine ounces.		*Fine ounces.*		
Placer	11,798.000	$243,886.31	1,032.00	$1,334.30	$245,220.61
Quartz	76,866.501	1,588,971.59	106,430.78	137,607.47	1,726,579.06
Copper ores	20.000	413.44			413.44
Lead ores	200.000	4,134.36	2,000.00	2,585.85	6,720.21
Total	88,884.501	1,837,405.70	109,462.78	141,527.62	1,978,933.32

Bullion of Oregon Production Deposited at United States Mints and Assay Offices during the Calendar Year 1902.

Institution.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Value.	
Mints:	*Fine ounces.*		*Fine ounces.*		
Philadelphia	147.119	$3,041.22	14.65	$18.94	$3,060.16
San Francisco	5,726.824	118,383.96	1,488.56	1,924.60	120,308.56
Assay offices:					
Boise	26,224.187	542,102.06	8,452.94	10,929.05	553,031.11
Denver	10.388	214.74	2.84	3.67	218.41
Helena	87.868	1,816.39	5.85	7.56	1,823.95
Seattle	369.962	7,647.79	22.59	29.21	7,677.00
Total	32,566.348	673,206.16	9,987.43	12,913.03	686,119.19

Disposition of Gold and Silver of Oregon Production during the Calendar Year 1902.

Disposition.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Value.	
	Fine ounces.		*Fine ounces.*		
Deposited at United States mints and assay offices	32,566.318	$673,206.16	9,987.43	$12,913.03	$686,119.19
Shipped to custom smelters and refineries by producers	56,318.153	1,164,199.54	99,475.35	128,614.59	1,292,814.13
Total	88,884.501	1,837,405.70	109,462.78	141,527.62	1,978,933.32

SOUTH APPALACHIAN STATES.

By D. K. Pope,

Assayer in charge of the United States assay office at Charlotte, N. C.

The precious metal output for this section in 1902 was $398,770.88, an increase over 1901 of $16,142.73—a little more than 4 per cent.

Comparison of 1902 with 1901.

GOLD.

State.	1901.	1902.	Increase (+) or decrease (−).
Alabama	$3,772.67	$2,938.47	− $834.20
Georgia	147,579.81	106,766.15	−40,813.66
Maryland	139.54	2,719.14	+ 2,579.60
North Carolina	60,410.71	93,650.30	+33,239.59
South Carolina	127,305.50	154,679.77	+27,374.27
Tennessee	254.88	142.36	− 112.52
Virginia	6,465.11	4,294.90	− 2,170.21
Total	345,928.22	365,191.09	+19,262.87

SILVER.

Alabama	$53.26	$123.35	+ $70.09
Georgia	869.67	751.28	− 118.39
Maryland	.33	4.28	+ 3.95
North Carolina	34,023.64	30,212.47	−3,811.17
South Carolina	396.68	749.70	+ 353.02
Tennessee	6.45	1.28	− 5.17
Virginia	1,349.90	1,737.43	+ 387.53
Total	36,699.93	33,579.79	−3,120.14

The amount deposited in the various mints and assay offices of the United States, according to their own reports, was—

Gold	$317,065.60
Silver	1,904.25
Total	318,969.85

constituting nearly 87 per cent of the gold produced, but less than 6 per cent of the silver.

The material sent from the section for treatment was less than two-thirds of the like material for 1901, and was mainly sent out as copper and other sulphuret ores, with a smaller proportion of matte. The amount of lead ores shipped was very small.

IMMEDIATE SOURCES OF PRODUCTION, 1902.

State.	Placers.		Mills.		Chlorination and cyanide works.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
Alabama	$529.21	$9.90	$2,271.80	$106.27	....	....
Georgia	15,790.44	84.29	63,418.15	250.11	$13,941.54	....
Maryland	776.90	1.23	1,553.80	2.44	....	....
North Carolina	16,588.46	151.79	54,986.98	1,234.15	....	....
South Carolina	4,669.36	12.38	64,013.72	705.87	84,767.49	....
Tennessee	142.36	1.28	....	....	....	....
Virginia	551.40	2.67	2,422.93	76.86	....	....
Total	39,048.13	263.54	188,667.38	2,375.70	98,709.03	....

State.	Dredging.		Shipping ore.		Untraceable.		Total.
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	
Alabama	....	....	$137.46	$7.18	....	....	$3,061.82
Georgia	$5,582.94	$12.65	6,574.74	400.41	$1,458.34	$3.82	107,517.43
Maryland	....	....	388.44	.61	....	....	2,723.42
North Carolina	21.59	....	21,062.98	28,807.70	990.29	18.83	123,862.77
South Carolina	....	....	976.74	14.83	252.46	16.62	155,429.47
Tennessee	....	....	....	....	....	....	143.64
Virginia	....	....	518.06	1,653.00	802.51	4.90	6,032.33
Total	5,604.53	12.65	29,658.42	30,883.73	3,503.60	44.17	398,770.88

SOURCE OF PRODUCTION.

Derivation.	Gold.	Silver (coining value).	Total.
Placers	$39,048.13	$263.54	$39,311.67
Mills	188,667.38	2,375.70	191,043.08
Chlorination and cyanide works	98,709.03	....	98,709.03
Dredging	5,604.53	12.65	5,617.18
Shipping ores	29,658.42	30,883.73	60,542.15
Unknown	3,503.60	44.17	3,547.77
Total	365,191.09	33,579.79	398,770.88

An examination of these sheets will show a decrease in placer gold, dredging, and river mining and in shipping ores, and a large increase in mill gold and in the output of chlorination works.

The Southern Smelting Works at Oakland, near Atlanta, discontinued operations early in the year; the Union Copper Company's smelter at Gold Hill, N. C., closed down at Christmas, 1901, and was not run at all in 1902. The product of that mine was sent out in the form of cobbed ores and concentrates, as was also the product of the Gold Hill Copper Company at the same point.

The Eustis smelter at Norfolk, depending largely on the Holloway mine in Person County, N. C., suffered by the decreasing output of that mine, but as a considerable amount of ore was purchased from other points of this region a respectable amount of matte was made. The stoppage of the Southern Smelting Works materially interferes with the raising of smelting ores in Georgia, Alabama, South Carolina, and North Carolina.

The dredge and river mining was almost entirely confined to Lumpkin and adjacent counties of Georgia. The returns from "works" was entirely due to the chlorination works of Haile mine, South Carolina, and of the Creighton mine, Cherokee County, Ga.

CYANIDING.

No cyaniding was done in the section, though work looking to that end was nearly completed at the close of 1902. Petty mining has fallen to small proportions.

The low price of copper did not seem materially to affect copper mining, the owners evidently hoping for an ultimate rise which might recompense them for the temporary loss.

The disposition to bond and to prospect mining properties, old and new, remained without marked change. As a whole, the movement of 1902 was conservative and healthy.

MARYLAND.

The production is markedly larger than in 1901, and from work of like character.

Counties.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Montgomery	128.074	$2,647.50	2.97	$3.84	$2,651.34
Unknown	3.465	71.64	.34	.44	72.08
Total	131.539	2,719.14	3.31	4.28	2,723.42

VIRGINIA.

The total production was a little less than in 1901. This decrease was due to the stoppage of several mines. A small return was reported from the Lovis mine, in Culpeper County, a small amount also from the Sulphur mine, in Louisa County. A little prospecting work was done in Halifax County, near Virgilina. The greater part of the gold produced by the State was placer gold.

In the Virgilina copper belt the High Hills mine, the Chapel mine, and the Wall mine remained in the same condition in which we found them in 1901, and there were no indications of a change for the present. Some shipments of concentrates were made from the High Hills, but the material was from ores mined in 1901. The only marked activity seen in this belt was at the Seaboard mine, 3½ miles northwest from Virgilina, and at the Pontiac mine near by. At the former mine two shafts had been sunk and a body of copper ore found of good grade; three large dumps of ore had been accumulated of high-grade bornite. No method of treatment has been determined upon.

At the Pontiac mine the work was of a prospecting character, with good results. The future of this interesting region will depend on the solution of the problem of concentration of the low-grade ores running from 2 to 4 per cent. The solution ought not to be difficult, since the mineral matter is almost entirely bornite and copper glance of a high specific gravity.

No start had been made in the projected railroad to High Hills, nor had the contemplated smelting plant materialized.

PRODUCTION, 1902.

Counties.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Culpeper	48.908	$1,011.04	4.00	$5.17	$1,016.21
Fairfax	31.269	646.38	.60	.78	647.16
Fauquier	6.500	134.36	1.70	2.19	136.55
Fluvanna	2.900	59.94	1.42	1.84	61.78
Goochland	20.900	432.04	5.26	6.79	438.83
Halifax	7.975	164.85	1,312.85	1,697.43	1,862.28
Loudoun	11.471	237.13	1.94	2.51	239.64
Louisa	10.647	220.09	.21	.27	220.36
Orange	9.124	188.61	.69	.89	189.50
Spottsylvania	9.500	196.39	4.45	5.75	202.14
Stafford	7.000	144.70	1.95	2.52	147.22
Unknown	41.572	859.37	8.73	11.29	870.66
Total	207.766	4,294.90	1,343.80	1,737.43	6,032.33

NORTH CAROLINA.

The general conditions of the gold industry of this State have already been touched upon.

The continuation of the Virgilina belt into Granville and Person counties in North Carolina showed considerable more activity than the northern end in Virginia. The mines at work were the Blue Wing, Holloway, Person Consolidated Copper and Gold Mining Company (formerly the Yancy), and the Tingen mine, all of which made shipments of ore, the second and third named on a large scale. The Holloway, the Blue Wing, and the Tingen made no attempt at concentration, hand dressing and picking excepted; the Person Consolidated had installed a part of its concentrating apparatus and the management were preparing for the remainder in 1903. The smelting plant is deferred for the present. The output of this belt is not likely to be enlarged in 1903.

In the Gold Hill neighborhood, Rowan County, three mines were at work, old Gold Hill mine, now called the Gold Hill Copper Company, the Union Copper Company, and the McMakin mine. The first and second companies mentioned confined their work almost exclusively to mining and milling as an incident to concentration, the product being sent from the State in the shape of "shipping ores;" no smelting operations were conducted at the Union in 1902. The McMakin continued its development work, and made only a small output of bullion. The McMakin corporation was also prospecting the Nussman and the Barringer mine in Stanly County.

The other copper properties of the State, the Emmons in Davidson County, the Fentress and Deep River in Guilford, and the Rowan in Rowan County, spent the whole year in development work, making a few small shipments only.

The output of Franklin, Halifax, Nash, and Warren was a little less than in 1902, and the larger part of this was from placer work.

The only work done in Moore County was at Swinton, and was merely of a prospecting character.

In Montgomery the Russell made a small output; the Iola mine in the eastern part of the county continued its work on a large scale during 1902 and with large returns; the exploratory work at this mine was pushed far ahead of the milling work, and large reserves have been opened up.

The Montgomery mine also, an entirely new proposition near the Iola, has been prospected to a depth of 150 feet; a 10-stamp mill has been put up; milling work was begun in February, 1903. A good body of ore is at command. The success at the Iola mine stimulated work at several other points in the vicinity. The mining work of this county, on the whole, is in a most satisfactory condition.

In Stanly County there was no change in the mines at work and the same statement may be made respecting the South Mountain area.

In Catawba County the only systematic work was done at the Shuford.

The Lilian mine was the only mine operated in Polk County. A little lead ore was shipped from the Davidson County mine.

In Randolph County the Sawyer mine was the only one regularly worked.

In Union County the Black and the Howie were in condition at the end of the year to do considerable work in 1903; a 10-stamp mill was erected at the former and the cyaniding plant at the latter was well on to completion. The placer work of 1902 remained almost unchanged. No systematic dredging work was undertaken and there is not at present any appearance of its revival in the immediate future.

In Cabarrus County the only large operations were at the Miami Company's mines (the Phoenix and the Furness). In the Phoenix, work was carried on at 540 feet depth, where two seams of ore were found of a combined width of 3 feet; work at the Furness was at 150 feet depth; the ore bodies exposed are wide and of a high grade. A very complete electrical mining plant has been erected, but the character of the reduction plant has not yet been determined on.

Considerable prospecting work was done at the Boger and four other properties in the Reed mine neighborhood.

In Mecklenburg County the output was more than tenfold larger than in 1901, chiefly due to the Capps and Wilhelmina mines. The former is down 172 feet and the latter 135 feet. Some shipping ores were sent from the county early in the year. The mining work in North Carolina seems to be in a healthy condition.

PRODUCTION, 1902.

County.	Gold.		Silver.		Total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Burke	171.063	$3,536.19	32.54	$42.07	$3,578.26
Cabarrus	50.760	1,049.30	67.44	87.20	1,136.50
Caldwell	.900	18.60	.09	.11	18.71
Catawba	74.736	1,544.93	12.35	15.97	1,560.90
Chatham	6.180	127.76	1.97	2.55	130.31
Cherokee	59.107	1,221.86	4.38	5.67	1,227.53
Clay	9.585	198.14	1.09	1.41	199.55
Cleveland	.900	18.60	.09	.11	18.71
Davidson	29.182	603.24	284.44	367.77	971.01
Franklin	30.271	625.77	4.83	6.24	632.01
Gaston	9.931	205.30	2.47	3.19	208.49
Granville	12.250	253.23	725 28	937.75	1,190.98
Guilford	44.962	929.45	28.29	36.57	966.02
Halifax	65.333	1,350.56	3.98	5.14	1,355.70
Henderson	23.713	490.19	8.22	10.63	500.82
Iredell	11.204	231.61	2.23	2.89	234.50
Lincoln	7.002	144.74	.42	.54	145.28
Macon	4.500	93.02	.45	.58	93.60
McDowell	99.114	2,048.85	28.33	36.63	2,085.48
Mecklenburg	988.764	20,439.58	665.45	860.41	21,299.99
Montgomery	1,862.348	38,498.15	522.06	675.00	39,173.15
Moore	26.256	542.75	15.12	19.55	562.30
Nash	14.137	292.24	5.26	6.79	299.03
Orange	24.415	504.70	14.47	18.71	523.41

Production, 1902—Continued.

County.	Gold.		Silver.		Total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Person	60.056	$1,241.47	8,136.94	$10,520.50	$11,761.97
Polk	64.130	1,325.70	10.04	12.98	1,338.68
Randolph	51.494	1,064.48	8.74	11.30	1,075.78
Rowan	490.095	10,131.17	12,685.84	16,401.86	26,533.03
Rutherford	108.416	2,241.15	21.63	27.96	2,269.11
Stanly	41.701	862.03	3.87	5.00	867.03
Union	34.826	719.90	26.64	34.45	754.35
Warren	5.750	118.86	1.34	1.73	120.59
Unknown	47.252	976.78	41.16	53.21	1,029.99
Total	4,530.333	93,650.30	23,367.45	30,212.47	123,862.77

SOUTH CAROLINA.

In South Carolina the yield in 1902 was $155,429.47, against $127,702.18 in 1901, a gain of more than one-fifth. The amount of placer work was considerably diminished and the shipping of ore fell to an insignificant point.

Nearly the whole work of the State was done in Lancaster County, at the Haile, and in Chesterfield, at or near the Brewer; neither point needs any detailed statement, for they have been often described in this series of reports. In both counties there was a considerable increase in 1902.

In the Haile the reserves are kept far ahead of the present necessities of the work, and each year sees economies introduced in the details of the administration, and new and improved machinery is constantly added.

The work in the other counties was too desultory to allow of description.

The work in this State is in a preeminently healthy condition.

Production, 1902.

County.	Gold.		Silver.		Total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Abbeville	8.327	$172.15	3.62	$4.68	$176.83
Anderson	4.800	99.19	2.58	3.34	102.53
Cherokee	77.250	1,596.89	50.04	64.70	1,661.59
Chesterfield	461.860	9,547.50	19.98	25.84	9,573.34
Greenville	51.250	1,059.44	43.97	56.86	1,116.30
Greenwood	.737	15.24	.35	.45	15.69
Lancaster	6,518.101	134,741.12	252.06	325.90	135,067.02
Oconee	14.750	304.91	9.59	12.39	317.30
Pickens	26.571	549.26	15.09	19.51	568.77
Spartanburg	118.780	2,455.40	76.74	99.22	2,554.62
Union	166.633	3,444.62	73.60	95.16	3,539.78
York	3.419	70.68	.48	.61	71.29
Unknown	30.155	623.37	31.74	41.04	664.41
Total	7,482.633	154,679.77	579.84	749.70	155,429.47

GEORGIA.

There was a marked fall in the production of the State, the yield being $107,517.43 in 1902 and $148,449.48 in 1901. The decrease was nearly 30 per cent, and was largely due to the fact that the Creighton mine in Cherokee County passed into the hands of a receiver, in the summer of 1902, and was thenceforth removed from the list of producing mines. Most of the other counties showed small decreases. Placer work fell off notably, and river mining was lessened more than one-half both on the Chestatee and on the Etowah. No new features were introduced in this class of work.

Carroll, Hall, Lumpkin, McDuffie, Meriwether, and White still remain the centers of the milling industry. The only new enterprise of note is the Seminole mine in Lincoln County.

The enumeration of mines is almost identical with that of 1901, and none of these, with the exception noted, show any marked change, nor has any new machinery nor any new method been introduced since the last report.

In Lumpkin County, the Crown Mountain, the Dahlonega Consolidated, the Standard, and the Wahl were the chief producers and carried on their work on the same lines as in 1901.

The Creighton mine in Cherokee continued its output till it went into the hands of a receiver. As the resources of this mine are unquestioned it will probably again go on the list of producers, but at what time is a matter of conjecture.

This discontinnance of the Oakdale (Atlanta) smelter cut down the "shipping ores" to one-third.

All of these drawbacks apparently will continue in full force for the present, and hence the yield of the precious metals in this State is likely to remain at a relatively low figure.

Production, 1902.

County.	Gold.		Silver.		Total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Bartow	3.100	$64.08	1.59	$2.05	$66.13
Carroll	80.347	1,660.91	12.27	15.87	1,676.78
Cherokee	1,763.714	36,459.22	23.06	29.80	36,489.02
Cobb	9.787	202.31	1.35	1.74	204.05
Dawson	163.221	3,374.09	12.59	16.28	3,390.37
Dekalb	2.140	44.24	.70	.91	45.15
Fannin	12.942	267.54	.05	.06	267.60
Forsyth	19.719	407.63	.52	.67	408.30
Gilmore	2	41.34	.24	.32	41.66
Gwinnett	7.567	156.43	.89	1.16	157.59
Habersham	3.378	69.82	1.09	1.42	71.24
Hall	116.724	2,412.89	24.76	32.02	2,444.91
Lincoln	34.802	719.42	162.32	209.88	929.30
Lumpkin	1,370.722	28,335.33	138.13	178.59	28,513.92
McDuffie	647.296	13,380.80	117.95	152.49	13,533.29
Meriwether	179.645	3,713.59	4.33	5.60	3,719.19
Morgan	1.200	24.80	.25	.32	25.12
Oglethorpe	11.216	231.85	1.68	2.17	234.02
Rabun	12.015	248.37	1.03	1.33	249.70
Union	59.243	1,224.67	.36	.47	1,225.14
White	504.806	10,435.28	57.26	74.03	10,509.31
Wilkes	27.703	572.67	2.78	3.59	576.26
Unknown	131.525	2,718.87	15.87	20.51	2,739.38
Total	5,164.812	106,766.15	581.07	751.28	107,517.43

ALABAMA.

The chief centers of work are at Gregory Hill and Blue Hill, in Tallapoosa County and in Cleburne County. In Tallapoosa County the product was largely mill returns; in the other counties the placers were the sources of the gold. No change was indicated at the close of 1902.

The distribution is shown below:

PRODUCTION, 1902.

County.	Gold.		Silver.		Total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Clay	7.787	$160.96	0.89	$1.15	$162.11
Cleburne	42.960	888.06	65.35	84.49	972.55
Randolph	5.056	104.52	1.10	1.42	105.94
Tallapoosa	80.891	1,672.17	27.85	36.01	1,708.18
Unknown	5.455	112.76	.22	.28	113.04
Total	142.149	2,938.47	95.41	123.35	3,061.82

TENNESSEE.

The bullion was probably from the placers in the Coker Creek neighborhood, Monroe County.

The extent of the gold industry is shown below:

PRODUCTION, 1902.

County.	Gold.		Silver.		Total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Monroe	5.987	$123.76	0.90	$1.16	$124.92
Unknown	.900	18.60	.09	.12	18.72
Total	6.887	142.36	.99	1.28	143.64

SUMMARY, 1902.

State.	Gold.		Silver.		Total.
	Fine ounces.	Value.	Fine ounces.	Coining value.	
Alabama	142.149	$2,938.47	95.41	$123.35	$3,061.82
Georgia	5,164.812	106,766.15	581.07	751.28	107,517.43
Maryland	131.539	2,719.14	3.31	4.28	2,723.42
North Carolina	4,530.333	93,650 30	23,367.45	30,212.47	123,862.77
South Carolina	7,482.633	154,679.77	579.84	749.70	155,429.47
Tennessee	6.887	142.36	.99	1.28	143.64
Virginia	207.766	4,294.90	1,343.80	1,737.43	6,032.33
Total	17,666.119	365,191.09	25,971.87	33,579.79	398,770.88

SOUTH DAKOTA.

By Franklin R. Carpenter, Ph. D., F. G. S. A.,
Mining and Metallurgical Engineer.

South Dakota's production of gold and silver for the calendar year 1902 was as follows:

	Fine ounces.	Value.
Gold	345,715	$7,146,563
Silver	351,000	[a] 453,818
Total value		7,600,381

[a] Coining value.

The gold-bearing area of South Dakota is confined to the southwestern portion of the State and to that part known as the Black Hills. They comprise an uplift of about the size of the State of Connecticut, consisting of a core of metamorphic rocks, usually denominated as Algonkian, but certainly pre-Cambrian, from around which the latter sedimentary beds dip in all directions.

CHARACTER OF ORES AND PROCESSES.

The most important gold ores are found in the folds of this metamorphic area, and the best known mine is the Homestake, which consists of a series of ore bodies or impregnated slates and schists carrying gold of an average value of 0.2 to 0.3 ounce in the richer bodies, but as low as 0.075 ounce in the poorer ones. This gold is free-milling to a wonderful extent, but not entirely so. The ordinary California stamp mill is employed, with copper plates inside the batteries, followed by copper apron plates of the usual construction. These again are followed by three series of copper plates plated with silver. The bulk of the gold is amalgamated upon these several series of plates, but some values escape, a part of which are in the 3 to 4 per cent of pyrite which the ores carry and another part in the gold, which, owing either to its finely divided condition or to other causes, does not amalgamate, and is further treated in the cyanide mill, the largest, perhaps, ever erected.

Here, as might be supposed, difficulties of leaching, owing to the fineness of the material, are encountered. The tailings, after leaving the mill, are separated or classified by pointed boxes into grades of different fineness. The coarser grades afford no new problems, and the gold is recovered by the ordinary leaching with weak cyanide solutions, as elsewhere. The most noticeable features are, perhaps, the magnitude of the work done and the excellence of the results obtained.

The fines, however, offer real difficulties in the way of leaching, and this problem has been attacked by Mr. Thomas Grier, the superintendent for nearly twenty years past, under whose management the property has been developed into what is now the largest and most productive gold mine in the world. Mr. Grier's invention is simplicity itself, and I can do no better than to quote his own description of it:

> The process contemplates the feeding into an ordinary cyanide leaching vat, in the ordinary way, of a very thick slime pulp to which is applied, as it goes in, a jet of steam, in order to raise a few degrees the temperature of the charge. Before starting the feed the vat is given slightly warmed water, sufficient to fill it from the real bottom to a point an inch or two above the canvas filter-cloth.
>
> Immediately after starting the feed, cold cyanide solution is gently applied through a network of perforated pipes between the real and false bottoms (the perforations are on the bottom side of the pipes). The cyanide solution begins immediately to raise the water against the descending thick slime and prevents its packing.
>
> When the feed has filled the vat to within a few inches of the top it is diverted to the next vat. The fluid portion, however, keeps on rising because the cyanide solution keeps on flowing in through the perforated pipes.
>
> The thick slime feed having stopped, a separation at the surface of the solid part from the liquid part at once begins, the former sinking, the latter rising, so that when the liquid reaches the point of overflow it is clear water. This raising of the water with the cyanide solution goes on until the solution has displaced all the water and reached the point of overflow itself. You may now keep the solution going through the charge as long as is necessary to make a satisfactory extraction.
>
> When the extraction is accomplished the solution is shut off and at once an ordinary solution of salt water is turned into the perforated pipes in its stead, which, in turn, raises the cyanide solution until it has all been overflowed.
>
> The cyanide solution being of greater specific gravity than the water portion of the slime, displaces the latter without mixing with it, while the salt water, being of still greater specific gravity displaces the cyanide solution without mixing with it. When the feed of thick slime is first turned into the vat, the ascending cyanide solution is given a speed of an inch or two an hour. This speed, however, must be gradually increased in order to compensate for the always increasing weight of slime coming in at the top. In other words, the force from the bottom must be regulated so that it will prevent hard packing of the slime. The overflowed or displaced clear water is, of course, husbanded, while the displaced cyanide solution is taken to the precipitation department. The salt water above the slime line may be siphoned off for re-use before sluicing the vat.
>
> Differences in density may be accomplished by the application of heat.

So perfectly and evenly does the heavy salt water displace and float off the cyanide solution that a clean perfect cut-off of the two can be made. The last mechanical difficulty in the application of cyanide solutions would seem to be removed by Mr. Grier's invention.

Slate deposits of the character of the Homestake are by no means unique in the Northern Black Hills, but as yet only the Homestake mines have made a great commercial success.

The Hidden Fortune Company, owning an immense area adjoining the Homestake, has erected a very large mill, in which a new departure of doubtful propriety has been made. It is proposed to avoid the amalgamation of the ores at the beginning of the process, as is practiced at the Homestake, and at once apply the cyanide solutions and amalgamate the tailings by passing them over silver plates. This departure, in the opinion of the writer, is a risky one for the following reasons:

Owing to the slowness with which coarse gold dissolves in weak cyanide solutions, it will not be saved there and in the amalgamation end it will miss the splash and driving action of the stamps, hence, will slide over the silver plates without amalgamating and be lost.

The outcome will be watched with considerable interest for should it prove successful there is no end to its application in the Black Hills and other low-grade gold-ore producing communities.

Other companies to the the north and to the south of the Homestake Company's properties are seeking extensions of its veins or new ones. To the south there is little doubt that by sinking to sufficient depth extensions of the Homestake ore body may be found. Indeed, my geological work in that field predicted such extensions, but at great depth. At the north end other ore bodies similar to the Homestake are already known to exist, and one is claimed to be quite as rich and as promising. It has been sunk upon and a crosscut driven so that its dimensions are fairly well known. Doubtless in the folds of these schists many other similar ore bodies are as yet undiscovered.

The slate ore bodies of the Homestake type are found with more or less interruption the full length of the Hills; but either they are of lower grade or not so free-milling, else their development would not longer be delayed. Other veins, consisting of lenticular masses of quartz, are being worked with good results, especially in the central and southern Hills.

The other ore bodies of interest are the so-called "refractory" ores, for, unlike the Homestake ores, they can not be amalgamated. These ore bodies consist of impregnations, usually in the quartzite beds overlying the slates, but occuring also in the lime shales overlying the quartzite as well as in the massive limestone of the Carboniferous age. These ores were first treated by chlorination, and four or more large and complete mills for this method were formerly employed in their reduction. Chlorination is now abandoned. The richer ores are smelted and the poorer ones treated by the cyanide process, which has made great progress here during the past year.

Pyritic smelting has been the most successful method yet applied to the higher grade silicious ores.

The term "pyritic smelting" was used in the sense first employed by Dr. John Percy, who introduced the term into English to describe a process employed at Kongsberg, Norway, and other places where iron pyrite is added to the charge to form a carrier, or matte, to collect the precious metals. The slags made at the Deadwood and Delaware plant, later known as the Golden Reward Smelter, were the most silicious known to the art. The smelter is now idle, partly on account of labor troubles, but mainly because of cheap transportation to outside smelters.

SOME MINES IN DETAIL.

The Homestake Company is and will probably remain the largest milling enterprise in South Dakota. During the year 1902, with its six stamp mills, aggregating 900 stamps, it crushed 1,218,089 tons of ore, yielding $4,303,977.57. The bulk of this value was recovered by simple amalgamation, as already described.

The tailings that were re-treated by its two cyanide mills were handled at a cost of $0.353 per ton, the world's record for low treatment. This record has heretofore been held in South Africa, where a record of $0.55 had been the lowest cost reached. The Homestake record was made with the high-priced but more skillful American labor as against kaffir labor in South Africa. The Homestake Company will enlarge its plant during 1903 to still greater dimensions by the addition of 100 stamps.

A full description and history of the Homestake mine, its vast underground workings, open cuts, transportation system, timber reserves, machine and other shops, foundry, stamp mills, and cyanide mills would alone require a volume. Suffice it to say that it is without doubt the largest and best equipped gold mine yet opened. James B. Haggin, of New York, and Mrs. Phoebe Hearst, of Washington, are the principal owners.

The Golden Reward Consolidated Company is next in importance to the Homestake Company. It has grown from a few claims carrying "refractory" gold ore and a small chlorination mill in 1887 to the ownership of 3,934 acres of mining property, covering every variety of refractory and free-milling ores. It now owns a 175-ton dry-crushing cyanide mill and a 500-ton pyritic smelter, which is the largest plant of the kind in America and up to date the most successful. The output of the company was somewhat curtailed during 1902 by the closing of their smelting works through labor troubles.

Among the officers of this company are E. H. Harriman, president; Harris Franklin, vice-president, and August Belmont, Robert W. Goelet, and William B. Devereaux, are upon the directory. These two companies are the strongest, oldest, and most productive now operating in the Hills.

The Columbus Consolidated Gold Mining Company owns 645 acres north of the Homestake and has developed ore bodies similar in character and extent to those of the Homestake. The Columbus vein proper is about 30 feet wide, but has always carried ore of good grade—about equal to the best Homestake grades. At a depth of 200 feet the company has driven a crosscut to the east and disclosed a vein 60 feet wide called the "Golden Gate vein." The same crosscut was also carried west and disclosed a low-grade vein about 30 feet wide, and beyond this again a vein called the "Mother vein," 247 feet wide.

The officers of this company claim that samples were taken from every foot of this width and gave a result of $4.96 per ton, or a value in excess of the best mines upon the belt. Beyond this again, a small vein 9 feet wide was found. The ground owned by this company also includes many acres of the refractory or flat ores lying above these vertical veins.

The Hidden Fortune Company's mill has already been mentioned. It is a model of convenience, lacking no essential appliance for successful work. It has a capacity of 300 tons per day, and is of the usual wet crushing type. Their ores are of both the Homestake type and the flat, refractory silicious type. The latter are occasionally very rich, a few cars having been shipped that exceeded $1,000 per ton. A. H. Danforth, a well-known Colorado mining man, is the manager.

The Horseshoe Mining Company operates mines of the flat silicious type near the town of Terry, although beneath the flat deposits in the vertical slates, ores of the other type have been found but not yet worked.

The company owns a cyanide mill near the mines of 500 tons capacity, one of the largest and best ever constructed, and a pyritic smelting plant at Rapid City, 50 miles from the mines, which has a daily capacity of 200 tons. The company controls 3,000 acres of ground and has shipped much ore to smelting points outside of the hills.

The Wasp No. 2 mine is situated upon the plateau south of Whitewood district and its ores are from the Cambrian quartzite, some of which are of the lowest grade ever yet made to pay by the cyanide process. Large areas are scraped free from the overlying alluvium, when large holes are drilled in the quartzite, chambered, and blasted with black powder, and thus, as in an ordinary rock quarry, thousands of tons are loosened. The larger blocks are drilled and broken into boulders small enough for the mill, which is of the dry crushing cyanide type, having a capacity of 125 tons per day. The mill has been operated for a month at a time upon ore yielding not more than $2.40 per ton, and yet earned a dividend. The yearly average per ton is somewhat higher, being about $4. As the property is located upon the line of the Homestake belt, the owners fully expect—and their expectations are justified—that beneath the quartzite the slates will have ores of the vertical or free-milling type.

The Imperial Gold Mining and Milling Company owns 400 acres in the flat or refractory ore sections and a dry-crushing cyanide mill located in Deadwood, which has a capacity of 140 tons per day. It has been in operation only the latter part of the year, but has made an excellent reputation. W. S. Elder, of Deadwood, is the president, and the company is a close corporation.

The Clover Leaf Mining Company owns and works the old Uncle Sam mine, about 6 miles northeast of the Homestake. It is a large body of gold-bearing quartz, lying in the vertical slates, and is almost entirely free-milling—so much so, that the tailings carry too little value to be re-treated by any process. The mill consists of 60 stamps of the usual type and the ore gives an average of $4 per ton. Mr. S. W. Russell is the manager and treasurer.

The Spearfish Gold Mining and Reduction Company operates in the Ragged Top district. It owns 317 acres and is the pioneer company of this district. It built a 200-ton cyanide mill in the years 1900 and 1901, which, in October, 1901, was burned to the ground. It, however, had run long enough to show what could be done with these ores, and the company immediately rebuilt. The ore averages by assay $5.285 per ton, 72.2 per cent of which, or $4.007 per ton, is recovered. The mining costs $1.07 per ton and the milling $1.03. The full cost of operating is $2.61 per ton, leaving a net profit of $1.465 per ton. The ratio of profits to expenses is 35.8 per cent, a wonderful record. This property is in the lime belt and is higher in the geological series than most mines in South Dakota. The ore is formed by a silicious replacement of the lime and contains no impurities to interfere with its treatment by cyanide. The property is owned at Colorado Springs, Colo.; W. S. Jackson, president.

The Potsdam Gold Mining Company is operating a 250-ton cyanide mill upon ores similar to those of the Spearfish Mining Company, and is paying monthly dividends.

The Deadwood Standard Gold Mining Company operates a 100-ton cyanide mill and owns 225 acres lying between the claims of the Spearfish and Potsdam companies.

The Victoria Gold Mining and Milling Company's properties are also located in this district, and the company is proposing a 200-ton mill.

All of these and other companies mine ores of very low grade, but of very great extent. The work done at the Spearfish, which is the pioneer, may stand for what all expect to do. Except for the application of the cyanide process, these and other deposits of similar grade would be worthless, as they are not free-milling and are too low grade for chlorination or smelting.

The Penobscot Mining Company is a new corporation, organized by ex-Lieutenant Governor Maitland, of Michigan. They own mines of the ordinary quartzite type, under which quartz veins of the free-milling class are found. They have a fine mill at Maitland where the low-grade quartzite ores are treated by cyanide, but the higher grade or "blue" ores are sold to the smelters. The company owns 1,200 acres of ground and is a close corporation, owned by Alexander Maitland and friends.

The Hidden Treasure Gold Mining and Milling Company owns 200 acres of lode claims four miles east of Deadwood, located in what is called the "phonolite" belt.

The Dakota Mining and Milling Company operates a 30-stamp cyanide mill in Deadwood which treats ores from its mines in the flat section near Portland. The ore comes from the Cambrian shales and is mined by scraping off the soil and at once blasting. It is open-quarry work.

The Holy Terror Mining Company is the best known mining company operating south of Lawrence County. The mine has been worked since 1894. It is a free-milling quartz mine situated in the slates and has been a constant dividend payer. The principal stockholder is John S. George, of Milwaukee. Gen. R. B. Hughes, of Spearfish, is president of the company.

The Grantz Gold Mining Company is another Southern Hills corporation operated by Otto P. Th. Grantz, one of the best known mining men in the Hills. The mine is an old one, formerly known as the St. Elmo. It is located near Custer. The company owns other claims, notably the Roosevelt mine, which carries ore of phenomenal richness but is not large.

The Golden Empire Mining Company claims to control 10,000 acres of land lying partly in South Dakota and partly in Wyoming. It is a South Dakota corporation and is tributary to Deadwood. Their claims cover a large number of tin lodes and tin placers. In the placer mining it is expected to recover both placer gold and stream tin at the same operation. The center of the company's claims may be considered to be at Mineral Hill, a mountain near the Wyoming-South Dakota line.

The gold placers have been productive from the first discoveries of gold in the Hills, and doubtless, from the coarse, unworn condition in which the gold is found, it was derived from veins in the immediate neighborhood; for, as expressed by the miners, "it has not traveled far" or it would have been more rounded and worn.

This by no means exhausts the list of even prominent mining companies in South Dakota. The principal interest at present centers in the large operations of the Hidden Fortune and Columbus companies, where success means the addition of more "Homestakes" to the producing mines of the Hills. Next to these the cyaniding of the low-grade ores of the Wasp No. 2 and Ragged Top class claim the greatest attention. These ores are of almost boundless extent, but notwithstanding their low gold contents they are mined and milled at a profit. More tons of ore will be mined during 1903 than ever before in the history of the Hills, but it will be of lower grade.

The salvation of this section has been in the application of the cyaniding process, as the ores of a grade sufficient to justify smelting were becoming scarce.

UTAH.

By B. H. Tatem,

Assayer in charge, United States assay office, Helena, Mont.

The State of Utah has added $27,882,153.59 to the value of the visible supply of precious metals produced in the United States during the year 1902, the quantity of gold, silver, copper, and lead mined during the year being the largest in the history of the State.

The quantity of each metal produced and the value thereof was as shown in the table below, the gold and silver being computed at the coinage rate for each, the copper and lead at the year's average price:

Description.	Quantity.	Value.
Gold.......fine ounces..	192,156.888	$3,972,235.41
Silver (coining rate).......do....	12,678,036.66	16,391,804 97
Copper, at $11.626 per hundredweight.......fine pounds..	25,954,026	3,017,415.06
Lead, at $4.069 per hundredweight.......do....	110,609,441	4,500,698.15
Total.......	....	27,882,153.59

A comparison of these figures with corresponding data for the year 1901 shows the following variations to have occurred:

Metal.	1901.		1902.		Increase (+) or decrease (−).
	Quantity.	Value.	Quantity.	Valve.	
Gold....... fine ounces..	184,803	$3,820,216	192,157	$3,972,235	+ $152,019
Silver (coining value).......do....	11,319,860	14,635,779	12,678,037	16,391,805	+1,756,026
Copper ....fine pounds..	26,931,888	4,340,612	25,954,026	3,017,415	−1,323,197
Lead.......do....	99,102,516	4,295,103	110,609,441	4,500,698	+ 205,595
Total	....	27,091,710	....	27,882,153	+ 790,443

The above showing is a pleasing one, and when taking into consideration the fact that the average prices of copper and lead for the year were much lower than the average prices for the same metals for the preceding year, the showing is one of which the State may well be proud.

The average price of copper for the calendar year 1901 was $16.117, and for 1902, $11.626. The average price of lead for 1901 was $4.334, and for 1902, $4.069. The output of copper and lead from the State for the year is computed on this basis. The silver-lead feature of the industry continues to play a leading part in the amount and value of the production, and the cyanide process is a prominent factor in the recovery of the gold values, more than one-half of the output of gold by the State for the year being credited to cyaniding. Two new smelters have been completed and opened in the State during the year—the American Smelting and Refining Company's plant at Murray, and that of the United States Mining Company at Bingham Junction.

Both of these plants are of the latest construction and are equipped with every modern improvement and device for the handling and reduction of large quantities of ore in the most thorough and economical manner.

Below are the figures of the output of gold by the different counties for the years 1901 and 1902, the loss or gain for each locality being shown:

GOLD.

County.	1901.		1902.		Increase (+) or decrease (−).
	Weight.	Value.	Weight.	Value.	
	Fine ounces.		*Fine ounces.*		
Beaver	1,003.718	$20,748.69	1,283	$26,521.96	+ $5,773.27
Juab	40,158.989	830,159.99	33,344.094	689,283.60	−140,876.39
Piute	18,007.721	372,252.63	24,302.202	502,371.10	+130,118.47
Salt Lake	27,911.565	576,983.25	34,923.135	721,925.28	+144,942.03
Summit	13,731.376	283,852.73	15,220.219	314,629.85	+ 30,777.12
Tooele	80,978.768	1,673,979.70	81,570.082	1,686,203.24	+ 12,223.54
Utah	120	2,480.62	165.122	3,413.38	+ 932.76
Impossible to classify	2,890.796	59,758.05	1,349.034	27,887.00	− 31,871.05
Total	184,802.933	3,820,215.66	192,156.888	3,972,235.41	+152,019.75

The changes in the quantity and value of the gold won from the different classes of ore in 1901 and 1902 are shown in the following table:

Classification.	1901.		1902.		Increase (+) or decrease (−).
	Weight.	Value.	Weight.	Value.	
	Fine ounces.		*Fine ounces.*		
In quartz and dry ores	6,688.150	$138,256.32	8,848.113	$182,906.73	+$44,750.41
In cyanide mill bullion	98,793.489	2,042,242.66	104,653.092	2,163,371.41	+121,128.75
In lead ores	17,724.888	366,405.96	21,317.007	440,661.65	+ 74,255.69
In copper ores	43,521.388	899,666.94	42,638.523	881,416.49	− 18,250.45
In milling ores	18,075.018	373,643.78	14,700.153	303,879.13	− 69,764.65
Total	184,802.933	3,820,215.66	192,156.888	3,972,235.41	+152,119.75

Of late years no gold has been taken from the Utah placers. From the above table it will be noted that the gain was largest from cyanide gold. This came principally from Tooele County, where are located the properties of the Consolidated Mercur and from Piute County, where is situated the Annie Laurie Mining Company. The counties of Beaver and Salt Lake, also Summit, show substantial increases in the production of this metal.

The amounts of silver originating in the several counties during the year 1902, compared with the corresponding figures for 1901, show the following results:

SILVER.

County.	1901.		1902.		Increase (+) or decrease (−).
	Weight.	Coining value.	Weight.	Coining value.	
	Fine ounces.		*Fine ounces.*		
Beaver	427,382	$552,574.70	221,866.73	$286,857.97	− $265,716.73
Juab	2,685,734.89	3,472,465.31	2,978,394	3,850,852.85	+ 378,387.54
Piute	48,213.26	62,336.34	71,758.19	92,878.26	+ 30,441.92
Salt Lake	706,944.54	914,029.30	1,048,828.26	1,356,060.78	+ 442,031.48
Summit	7,060,623.56	9,128,887.03	7,952,515.12	10,282,039.75	+1,153,152.72
Tooele	305,956	395,579.47	294,551.61	380,834.40	− 14,745.07
Utah	640	827.47	1,125.45	1,455.13	+ 627.66
Impossible to classify	84,365.82	109,079.04	108,997.30	140,925.83	+ 31,846.79
Total	11,319,860.07	14,635,778.66	12,678,036.66	16,391,904.97	+1,756,026.31

There is little mining of silver ore in Utah where this metal is the chief value contained, nearly all of the large amount of silver shown above having been associated with other values in the ores. Summit County leads in the large increase of silver for the year, producing approximately 1,000,000 ounces more than the preceding year.

Salt Lake and Juab counties follow in the order named with substantial increases, and nearly every county in the State showed an increase of production of this metal for the year.

In the table which follows is shown the origin of the silver in the several classes of ore, comparatively, for the years 1901 and 1902:

Classification.	1901.		1902.		Increase (+) or decrease (−).
	Weight.	Coining value.	Weight.	Coining value.	
	Fine ounces.		*Fine ounces.*		
In quartz and dry ores	850,266.61	$1,099,334.65	734,626.02	$949,819.50	− $149,515.15
In cyanide mill bullion	48,213.26	62,336.34	71,758.28	92,778.38	+ 30,442.04
In lead ores	7,357,481.54	9,512,703.35	8,700,218.22	11,248,766.99	+1,736,063.64
In copper ores	2,201,143.66	2,845,923.11	2,409,592.02	3,115,432.11	+ 269,509.00
In milling ores	862,755	1,115,481.21	761,842.12	985,007.99	− 130,473.22
Total	11,319,860.07	14,635,778.66	12,678,036.66	16,391,804.97	+1,756,026.31

The silver contained in lead ores was contained in the shipments of this product to the various smelters for treatment. It originated principally from the mines of the Tintic district and Park City. Considerable argentiferous lead ore was also taken from the mines around Bingham and Frisco. The silver won from copper ore was contained in the product from Bingham, Eureka, and Park City. Outside of the operations of the Annie Laurie Mining Company, in Piute County, the silver won by the operation of the cyanide plants was unimportant and played but a small part in the output of the State. The silver obtained from dry ore and concentrates is also of lesser importance and was contained in the shipments from Mercur, Eureka, Park City, and Frisco.

In the tables which follow are shown the output of precious metals for each county of the State for the year:

BEAVER COUNTY.

Metal.		Quantity.	Value.
Gold	fine ounces	1,283	$26,521.96
Silver (coining value)	do	221,866.73	286,857.97
Copper	fine pounds	914,088	106,271.87
Lead	do	5,022,768	204,376.43
Total			624,028.23

This county, situated in the southwestern part of the State on the line of the Oregon Short Line Railway, witnessed much activity the past year in the district around Milford and Frisco. The Horn Silver Mining Company has maintained a steady output from this county for a number of years and still continues to be the chief producer. Their product is a silver-lead ore. During the past year the energies of the management have been directed toward blocking out large bodies of copper ore hitherto passed by, and only sending to the smelters the copper taken out in the course of this work. Among the promising mines of this county may be mentioned the Cave Consolidated,

O. K., O. K. Extension, Cactus, Beaver Consolidated, Majestic, Harrington, Hickory, Blackbird, Erie, and others. A new smelter, to be erected by the Majestic Copper and Smelting Company, is promised this county for 1903, and the coming year will no doubt show a greatly increased output.

JUAB COUNTY.

Metal.	Quantity.	Value.
Gold .... fine ounces..	33,344.094	$689,283.60
Silver (coining value) .... do....	2,978,394	3,850,852.85
Copper .... fine pounds..	5,271,921	612,913.53
Lead .... do....	20,266,507	824,644.17
Total	....	5,977,694.15

This county, lying a trifle west of south from Salt Lake City, distant about 65 miles, comprises what is known as the Tintic district, in which are situated the camps of Eureka, Silver City, Mammoth, Robinson, and Fish Springs. Travel and transportation are afforded this district by the Oregon Short Line and Rio Grande Western railroads. Progress in the mining industry in this county was rather indifferent during the year. The suspension of shipments by the Centennial-Eureka, one of the largest producers—which has been hung up for nearly the entire year—did much to reduce the exhibit this county would otherwise have made. A very rich strike of silver-bearing ore was made in the Gemini at a depth of about 2,000 feet.

In this county are located the greatest number of noted producers contained in any one county of the State. Besides the two above named are the Lower Mammoth, Ajax, Uncle Sam Consolidated, Bullion-Beck, Yankee Consolidated, Tesora, South Swansea, Swansea, Grand Central, Utah, Godiva, Carisa, Alaska, Eureka Hill, Mammoth, and others.

PIUTE COUNTY.

Metal.	Quantity.	Value.
Gold .... fine ounces..	24,302.202	$502,371.10
Silver (coining value) .... do....	71,758.19	92,778.26
Total	....	595,149.36

During the year 1902 this county contributed to the mineral wealth of the State $160,000 more than during the preceding year, the principal producer being the cyanide property known as the Annie Laurie Mining Company. Around Kimberly and Marysvale a great deal of prospective work has been done and the coming year will undoubtedly give to the State some new producers from this county.

SALT LAKE COUNTY.

Metal,	Quantity.	Value.
Gold .... fine ounces..	34,923.135	$721,925.28
Silver (coining value) .... do....	1,048,828.26	1,356,060.78
Copper .... fine pounds..	14,907,806	1,733,181.53
Lead .... do....	3,257,179	132,534.61
Total	....	3,943,702.20

The principal point of production in this county is the district around Bingham, where considerable mining activity was displayed during the year 1901. Among the larger producers may be mentioned the Bingham Consolidated, Storey, Ben Butler, Utah Consolidated, New England, United States, and others. Immediately south of Salt Lake City is located the smelting center of Murray, Utah. In this valley, within a radius of 6 miles of Salt Lake City, are located four large smelters, the plants of the United States Company, Highland Boy, Bingham Consolidated, and the American Smelting and Refining Company.

The latter two smelters were opened during the year. The capacity of these combined plants is about 5,000 tons daily, ore from all the mining sections of the State being shipped to these smelters for treatment.

SUMMIT COUNTY.

Metal.	Quantity.	Value.
Gold ....fine ounces..	15,220.219	$314,629.85
Silver (coining value) ....do....	7,952,515.12	10,282,039.75
Copper ....fine pounds..	3,076,800	357,708.77
Lead ....do....	77,249,960	3,143,300.87
Total	....	14,097,679.24

The above table shows an increase of nearly $1,700,000 over the year 1901, the largest increase of any county in the State. Silver-lead mining in the neighborhood of Park City has made this county long famous as one of the most important mining centers in the United States. Here are located the Silver King, Daly-West, Daly-Judge, Ontario, California, Comstock, and others. All of the above-named mines are producers of silver-lead ores, a small portion of which is treated by milling and concentration at Park City, but by far the largest portion being shipped to the smelters in the Salt Lake Valley.

Among the magnificent properties in the Park City district the Silver King still holds undisputed sway as leader. The ore already uncovered guarantees an output as great as the present for a number of years to come. Closely following the Silver King will be found the Daly-West, Daly-Judge, and Ontario. A number of new properties are being developed in this district, and the promises for the future of the county are very bright.

TOOELE COUNTY.

Metal.	Quantity.	Value.
Gold ....fine ounces..	81,570.082	$1,686,203.24
Silver (coining value) ....do....	294,551.61	380,834.40
Copper ....fine pounds..	1,486,686	172,842.11
Lead ....do....	3,951,325	160,779.41
Total	....	2,400,659.16

The output from this county originates principally at and about Mercur. A small amount, however, comes from the Deep Creek district, in the western part of the county. The plant of the Consolidated

Gold Mines Company, located at Mercur, about 60 miles from Salt Lake City and at an elevation of 6,000 feet above sea level, is the site of one of the largest cyanide plants in the world. This company is a consolidation of the Mercur and Golden Gate mines, the mill being built on the Golden Gate property. The mine and mill were never in a more flourishing condition; both have been running steadily throughout the year, and from the large amount of ore already blocked out there is no reason to apprehend a failure of the mines to supply the ore needed to keep the mill running at full capacity for years to come. The ore occurs in a blanket formation, thus reducing the cost of mining to a minimum. About 400 men are employed at the mines and 150 at the mill. Other prominent producers of this county are the Ophir Hill Consolidated, Sunshine, Spotted Fawn Group, Sacramento, and Overland.

The statistical tables of the Utah production that appear in connection with this review for the year 1902, showing the quantity and value of the production of the State, its origin by classes and counties, together with the final disposition of the ores and bullion for treatment and sale, have been assembled from confidential returns furnished by the producers of their output. The totals thus obtained are verified by the statistics of the United States mints and assay offices and by the summaries that are furnished from the records of the smelters and refineries.

PRODUCTION OF GOLD AND SILVER IN UTAH DURING THE CALENDAR YEAR 1902.

SUMMARY BY COUNTIES.

Counties, etc.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Coining value.	
	Fine ounces.		*Fine ounces.*		
Beaver	1,283	$26,521.96	221,866.73	$286,857.97	$313,379.93
Juab	33,344.094	689,283.60	2,978,394	3,850,852.85	4,540,136.45
Piute	24,302.202	502,371.10	71,758.19	92,778.26	595,149.36
Salt Lake	34,923.135	721,925.28	1,048,828.26	1,356,060.78	2,077,986.06
Summit	15,220.219	314,629.85	7,952,515.12	10,282,039.75	10,596,669.60
Tooele	81,570.082	1,686,203.24	294,551.61	380,834.40	2,067,037.64
Utah	165.122	3,413.38	1,125.45	1,455.13	4,868.51
Returns from custom smelters, mints, and assay offices, impossible to classify by counties	1,349.034	27,887.00	108,997.30	140,925.83	168,812.83
Total	192,156.888	3,972,235.41	12,678,036.66	16,391,804.97	20,364,040.38

BULLION OF UTAH PRODUCTION DEPOSITED AT THE UNITED STATES MINTS AND ASSAY OFFICES DURING THE CALENDAR YEAR 1902.

Institution.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Coining value.	
Mints:	*Standard ozs.*		*Standard ozs.*		
Denver, Colo	4,104.581	$76,364.29	1,546.64	$1,799.73	$78,164.02
San Francisco, Cal	232.700	4,329.30	98.53	114.65	4,443.95
Assay offices:					
Boise, Idaho	10.449	191.40	2.21	2.57	196.97
New York, N. Y	89,611.305	1,667,187.08	50,611.65	58,893.56	1,726,080.64
Total	93,959.035	1,748,075.07	52,259.03	60,810.51	1,808,885.58

PRODUCTION OF GOLD AND SILVER IN UTAH (ORIGIN DETAILED) DURING THE CALENDAR YEAR 1802.

Origin.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Coining value.	
	Fine ounces.		*Fine ounces.*		
In quartz and dry ores	8,848.113	$182,906.73	734,626.02	$949,819.50	$1,132,726.23
In cyanide bullion	104,653.092	2,163,371.41	71,758.28	92,778.38	2,256,149.79
In lead ores	21,317.007	440,661.65	8,700,218.22	11,248,766.99	11,689,428.64
In copper ores	42,638.523	881,416.49	2,409,592.02	3,115,432.11	3,996,848.60
In milling ores	14,700.153	303,879.13	761,842.12	985,007.99	1,288,887.12
Total	192,156.888	3,972,235.41	12,678,036.66	16,391,804.97	20,364,040.38

ORIGIN, BY PERCENTAGES, OF THE PRODUCTION OF GOLD AND SILVER IN UTAH DURING THE CALENDAR YEAR 1902.

Origin.	Gold.	Silver.
	Per cent.	*Per cent.*
In quartz and dry ores	4.60	5.79
In cyanide-mill bullion	54.46	.56
In lead ores	11.09	68.62
In copper ores	22.19	19.01
In milling ores	7.66	6.02
Total	100	100

PRODUCTION OF COPPER AND LEAD IN UTAH DURING THE CALENDAR YEAR 1902.

SUMMARY BY COUNTIES.

Counties, etc.	Copper.	Lead.
	Fine pounds.	*Fine pounds.*
Beaver	914,088	5,022,768
Juab	5,271,921	20,266,507
Salt Lake	14,907,806	3,257,179
Summit	3,076,800	77,249,960
Tooele	1,486,686	3,951,325
Utah	....	115,400
Custom smelters in addition to the above, not possible to distribute by counties	296,725	746,302
Total	25,954,026	110,609,441

DISPOSITION OF THE GOLD AND SILVER OF UTAH PRODUCTION DURING THE CALENDAR YEAR 1902.

Disposition.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Coining value.	
	Fine ounces.		*Fine ounces.*		
Deposited at the United States mints and assay offices	84,563.132	$1,748,075.07	47,033.13	$60,810.51	$1,808,885.58
Shipped to custom smelters and refineries by producers	107,593.756	2,224,160.34	12,631,003.53	13,330,994.46	18,555,154.80
Total	192,156.888	3,972,235.41	12,678,036.66	16,391,804.97	20,364,040.38

WASHINGTON.

By Frederick A. Wing,

Assayer in charge United States assay office, Seattle, Wash.

The production of gold and silver, copper and lead in the State of Washington for 1902 shows a loss in gold and an increase in silver. The output of each of the metals mentioned was as follows:

Metal.	Quantity.	Value.
Gold ....fine ounces..	18,115.019	$374,470.66
Silver (coining value) ....do....	721,450.16	932,784.04
Copper, at $11.627 per hundredweight ....fine pounds..	40,426.00	4,699.93
Lead, at $4.069 per hundredweight ....do....	242,516.00	9,867.98
Total....	....	1,321,822.61

The decrease in gold was due to the failure of several mines to continue operations during 1902 that were producers in 1901.

The increase in silver was nearly 100 per cent. The principal contributors to this gain were Stevens and Snohomish counties. These gains and losses are best shown by the following table of comparison:

Production of Precious Metals in the State of Washington during the Year 1902 compared with that of 1901.

Metal.	1901.		1902.	
	Quantity.	Value.	Quantity.	Value.
Gold ....fine ounces..	31,987.467	$661,239.61	18,115.019	$374,470.66
Silver ....do....	377,381.17	487,927.16	721,450.16	932,784.04
Copper ....fine pounds..	29,520.00	4,757.74	40,426.00	4,699.93
Lead ....do....	216,841.00	9,396.44	242,516.00	9,867.98
Total....	....	1,163,320.95	....	1,321,822.61
Net increase	....	....	....	158,501.66

The larger part of the silver and lead ores produced in the State came from Stevens County, and nearly all was from the Deer Trail consolidated mines. The group consists of the Deer Trail No. 2, on which the discovery was made; the Royal and Deer Trail No. 1 lying to the right; the fractional claim Legal Tender and Victor above, and the Elephant still higher up the mountain, being the claim on which the apex appears. Some 5 or 6 tunnels have been driven in from near the outcropping on Deer Trail No. 2, ranging from 200 to 500 feet, until they come to the break off, which occurs near the upper line of the fractional (Legal Tender) claim, necessitating a drop in the workings before the vein could be picked up again. This gave the Legal Tender owners reason to maintain that they were on new and distinct veins, causing some litigation, but happily all differences have been adjusted and there will be no further delay in the work. To tap the ore bodies on the Elephant a tunnel had to be run near the line of the Royal up through the Victor some 225 feet in length, a drift run right and left about 1,000 feet, and two uprises of 180 and 225 feet through to the surface were made, furnishing the 25 cars that were shipped from the Elephant during the year. About $27,500 worth of ore was taken from Deer Trail No. 1 during the year, which was leased to outside parties, while the Victor contributed some 10 or 12 cars during the period. The values are found in a true fissure vein, averaging from 2 to 4 feet in width, and the formation is in the nature of stratified lime rock. Over 5,000 feet of tunnels have been run on these properties, which are located near Springdale on the Spokane and Northern. The company built a road from the mines to the railroad at a cost of over $6,000.

KITTITAS COUNTY.

The Cedar Valley Gold Mining Company began operations this season with one giant on the Swauk benches, opening up a new property, and have made the surveys for a ditch to bring in more water. The ditch will be about two miles in length, and will give them about 1,000 miner's inches, a considerable increase over the present supply. It is the intention of the company to put in three giants next year. Other properties in this district have been worked to some extent as water was available, but the output from these placers was not so large as in former years. Half a mile up the Swauk from these diggings Messrs. Berry & Middleton have installed a two-stamp experimental mill on their quartz properties, working a low-grade free-milling ore with fairly satisfactory results.

FERRY COUNTY.

Ferry County still maintained its lead in production for the year despite the fact that the smelters in that section were obliged to curtail operations considerably, owing to the shortage of coke. There was a strike on among the coke makers of the Crows Nest mine, from whence the smelters secure their supply, and as a result the Northport, Granby, and other smelters in this section were often obliged to close down all, or nearly all, of their furnaces. The Quilp, California, Lone Pine, Tom Thumb, Morning Glory, and other smaller properties were producing during the year, the California leading and the Quilp next in amount. Late in the year Mr. Robert Angus was given the management of the Quilp, since which time the mine has been steadily operated with satisfactory results, shipping considerable ore to the Granby smelter at Grand Forks, British Columbia, and to the smelter at Tacoma. This mine is developed to the 400-foot level, having three levels connected by the main shaft and two intermediates, giving practically five levels. It is equipped with a Rand four-drill commpressor, operated by steam power, and is well situated for handling ore economically, as the Kettle Valley road has a spur to the mine far enough below the mouth of the tunnel to enable the ore to be dumped into the cars direct. The transportation facilities of Republic are, at last, all that could be expected in so new a camp. The district, however, is still handicapped by the character of its ores. They are highly siliceous, requiring iron and lead fluxing ores in combination, which necessitates the finding of a market for them elsewhere. Northeast of the camp in the Belcher mine, located on the same belt as the California, it is claimed there is a large deposit of sulphide ores that may solve the problem of home treatment and may result in the building of a local smelter in the near future. Over in the Deep Creek district the Silver Butte produced some lead, but water interfered with its operations. Next season the mine expects to have better pumping facilities and an increased output as a result. In and about Chesaw considerable development has been done during the year. The Opal reports a new strike of high-grade ore, and will be counted among the State's producers by the end of another season. Rossburg is quite active also, and bids fair to be a prosperous camp.

Preparations are being made to resume operations on the Effie R., over in the Pierre Lake district. On Palmer Mountain, to the west, the Ruby and Horn silver mines are being pushed along toward the producing stage, so that, taken as a whole, the mining districts of northeastern Washington are in a rather promising condition.

WHATCOM COUNTY.

The mines of Whatcom County are rapidly becoming among the best developed in northwestern Washington. The Mount Baker district is gradually yielding to the attacks of determined men, and as a result both steam and wagon roads have pushed into the wilderness, affording facilities for taking in machinery for the development of its well-known mineral resources. It has taken nearly three years to get the machinery on the ground for the 10-stamp mill of the Post Lambert mine. However, they have succeeded, and the mine will be in operation early in 1903. To the northwest of Mount Baker the Great Excelsior mines are located, and the starting of the mill on the 25th of August was the event of special interest to those directly interested, as well as to those interested in other properties in the district. It marks the beginning of actual mining operations in this portion of the Cascades. The ledge on which is located the Great Excelsior is exposed in places by high bluffs, being visible along the mountain side some 3,000 feet, and from indications must be fully 500 feet in width. The tunnel is bored 280 feet and is in ore. The mill is built for 20 stamps, 5 being in place; the other 15 will soon be installed. The entire plant is operated by a 5-foot Cassell water wheel, the supply coming from Gulch Creek through 600 feet of 14-inch pipe, with 340-foot head, giving ample power for economical treatment. Eight miles west of the Great Excelsior the Nooksack is situated, and its 5-stamp mill was installed during the latter days of the year. To this it will add another set of 15 stamps and a Bryan mill. It has about 900 feet of tunneling and about 130 feet of stoping. This property is on an extensive low-grade ore body of slate and porphyry and can be easily concentrated. Mill tests are said to have shown an average of $45 per ton. The mill of the Mammoth, in the Slate Creek district, is rapidly nearing completion. Motive power is derived from a Pelton wheel, the water being carried 7,000 feet through a flume, giving a fall of 405 feet. The machinery for the mill is all of the latest and most efficient kind. Over on the north fork of Slate Creek the Mountain Goat is getting in shape to increase their output. They have their cyanide vats ready and have over 1,000 feet of tunnels and other development work done. Other properties in this district that are pushing operations are the Gold Ridge, the Tacoma, Chancellor, and Whistler.

SNOHOMISH COUNTY.

One of the largest producers in the State for the calendar year 1902 was the Monte Cristo group. It is doubtful if there is a case on record where greater questionable statements have been scattered abroad concerning a mining district than have been published regarding Monte Cristo. Scientific reports written by geological experts, who have never been inside a single mine in the camp, who have gathered their information from discharged employees or officials, have been foisted upon the mining public as facts, that are easily disproven by a personal visit and thorough inspection, until they have been taken up by novices who have disposed of the subject in one general statement that there was "nothing" there, and all this time the old reliable mines, like the Pride of the Mountain, the Mystery, and other properties owned by the Monte Cristo Mining Company, have been jogging along undisturbed by these reports and uninterruptedly sending out their product to be added to the world's wealth. The ore bodies continue to yield their golden treasure, the depth of the workings continue to deepen, the veins continue to widen with depth, despite the fact that the learned geologist has said they are "only superficial," they "can not continue," etc. The district has had much to contend with, however, like the washing out of its only means of transportation and other natural causes, and these disastrous interferences have kept the district back several years, but they have not, nor can they destroy the value nor detract from the importance of its mines. Mismanagement could and did prevent the mines from paying dividends, but it could not change the character nor riches of the ore bodies. Exorbitant freight charges could reduce the output to a minimum, but that only deferred the date of the camp's ultimate prosperity. Under the management of Capt. John P. Christopher the mines of the Monte Cristo Company are being developed at last in an intelligent manner, and the old concentrating plant, under the supervision of Mr. Billedeau, has been perfected until they are to-day saving over 90 per cent of the mineral. The mill is equipped with 10 Frue Vanners, 8 Likenbach tables, 18 four-compartment jigs, 6 sets of Cornish rolls, 4 hydraulic classifiers, and 10 Tromell screens, settling tanks, etc. They consume over 3,000 gallons of water a minute, and the process of reduction seems to be about perfect, as well as very complete in its saving. Not over 6 to 8 per cent of the mineral is not accounted for when it has finished its journey from the first breakers to the last settling tank. A personal inspection of the plant and of the mines themselves will convince anyone of the great injustice done this camp in some of the published reports of it. In the Pride, Mystery, and Rainey many thousands of feet of tunnels and shafts have been run, and the aerial tram that brings the ore from the Pride, which is above and beyond the Mystery, has hardly ever ceased in its travels of more than 7,000 feet up and over the top of the mountain. The production of these mines for the year nearly equals the output of any district in the State, and another season will witness a great increase of the output of the camp,.taken as a whole, for preparations are now being made for a resumption of work on the "Justice," or, as it is more familiarly known, the "Golden Cord," on which much work was done during the early days of the camp, but which has been inactive for a long time, waiting conditions that have finally arrived. When the Willmans went into this section along in the early nineties they were the first white men to invade this unknown wilderness. They took with them, however, mining experience and pluck, and they have the same abiding faith to-day in the district that they then had. They thought they were right then, and to-day they know they were. Some day, and that in the very near future, one of the best producing mining districts in the whole Northwest will be right here at Monte Cristo.

Three or 4 miles east of the Monte Cristo camp, just over the divide, the McIntosh boys have been working for several years to get the property of the Penn Mining Company thoroughly developed before attempting anything in the way of shipping. As a result of the expenditure of over a quarter of a million of dollars it has fully 10,000 feet of tunnels, shafts, upraises, and drifts completed; a good wagon road built to connect with the railroad; the finest camp in the whole Northwest, and ore enough in sight to keep the mine running for many years. Work on the mine began in 1892 and has never let up for a moment. They are thoroughgoing, level-headed mining men and presumably know what they are doing, and it would seem that if the ore bodies of this section of the Cascades were only "superficial," "lacked depth," or were of little value, as some "expert geologists" have maintained, these men would have discovered their error long ago.

At Silverton, a few miles below and on the same range, the new concentrator of the Independence is rapidly nearing completion. The Bonanza Queen is being forced ahead and will join the producers early in 1903. In fact, there is much encouragement for one who has the success of Washington's mining interests at heart to be derived from a personal inspection of the districts lying in the northwestern portion of the State.

Construction work and actual mining have been prosecuted uninterruptedly on the Ethel during the year. A big 300-foot working tunnel was started, which will go through the John Day property into the Ethel ledge. At the dividing line between the two properties it will be down about 1,500 feet, gaining 1 foot vertically for each horizontal foot driven until some 4,000 feet depth is attained. A big shoot of rich ore was recently struck in the east drift, showing very high values. This shoot has been drifted on for some 130 feet and is still in ore. Machinery to handle the increased output of the mine has been ordered, and when the new working tunnel is completed they will do away with the old tramway and incline, largely reducing the cost of operations thereby.

The Forty-five is working 20 men and shipping ore. The upraise has reached the high-grade ore in the upper workings and stoping has been going on for some time. The ore in the 325-foot level continues high in grade and good width with depth. The producing mines reporting are as follows:

ASOTIN COUNTY.

E. Baumeister & Co., Asotin.

CHELAN COUNTY.

Lucky Queen Mining Company, Blewett; Tom Thumb Mining Company, Lone Pine-Surprise Consolidated Mining Company, Quilp Gold Mining Company, Morning Glory Gold Mining Company, Apollo Consolidated Gold Mining Company, Eureka district; and Chelan Mining Company, Peshastin district.

KITTITAS COUNTY.

Bank of Ellensburg, Charles Enenkel, Henry Horstman, John T. Bethel, National Bank of Commerce, G. D. Virden, and Edw. Menkel, Swauk Creek district.

OKANOGAN COUNTY.

Loundagin Brothers, Chesaw; and Oroville Trading Company, Oroville.

SNOHOMISH COUNTY.

Monte Cristo Mining Company, Monte Cristo district; and Forty-five Consolidated Mining Company, Wallace district.

STEVENS COUNTY.

Old Dominion Mining Company, Old Dominion district; Deer Trail Consolidated Mining Company, Cedar Canyon and Bossburg districts; and Cedar Canyon Consolidated Mining Company, Cedar Canyon district.

WHATCOM COUNTY.

Mammoth Gold Mining Company and Eureka Mining Company, Slate Creek district.

PRODUCTION OF GOLD AND SILVER IN WASHINGTON (ORIGIN DETAILED) DURING THE CALENDAR YEAR 1902.

Origin.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Value.	
	Fine ounces.		*Fine ounces.*		
Placer	3,000	$62,015.50	750	$969.70	$62,985.20
Quartz	15,105.019	312,248.44	368,700.16	476,703.23	788,951.67
Copper ores	10	206.72	2,000	2,585.86	2,792.58
Lead ores			350,000	452,525.25	452,525.25
Total	18,115.019	374,470.66	721,450.16	932,784.04	1,307,254.70

BULLION OF WASHINGTON PRODUCTION DEPOSITED AT THE UNITED STATES MINTS AND ASSAY OFFICES DURING THE CALENDAR YEAR 1902.

Institution.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Value.	
Mints:	*Fine ounces.*		*Fine ounces.*		
Philadelphia	13.984	$289.07	2.75	$3.55	$292.62
San Francisco	357.698	7,394.27	55.53	71.80	7,466.07
Assay offices:					
Boise	141.292	2,920.76	22.15	28.64	2,949.40
Denver	27.044	559.05	5.08	6.57	565.62
Helena	637.943	13,187.45	130.88	169.22	13,356.67
Seattle	7,709.324	159,365.87	439.37	568.07	159,933.94
Total	8,887.285	183,716.47	655.76	847.85	184,564.32

DISPOSITION OF GOLD AND SILVER OF WASHINGTON PRODUCTION DURING THE CALENDAR YEAR 1902.

Disposition.	Gold.		Silver.		Total value.
	Weight.	Value.	Weight.	Value.	
	Fine ounces.		*Fine ounces.*		
Deposited at United States mints and assay offices	8,887.285	$183,716.47	655.76	$847.85	$184,564.32
Shipped to custom smelters and refineries by producers	9,227.734	190,754.19	720,794.40	931,936.19	1,122,690.38
Total	18,115.019	374,470.66	721,450.16	932,784.04	1,307,254.70

WYOMING.

By Franklin R. Carpenter, Ph. D., F. G. S. A.,
Mining and Metallurgical Engineer.

Wyoming's production of gold and silver for the calendar year 1902 was as follows:

	Weight.	Value.
	Fine ounces.	
Gold	2,188	$45,230
Silver	5,200	[a] 6,623
Total value	....	51,853

[a] Coining value.

The prospective mineral value of Wyoming is very great, so great that one is at a loss to understand why development has been so long delayed.

During the past year I have received ores from several sections in Wyoming, together with descriptions of the veins from which they were taken. Almost invariably I found them of a grade which would justify working.

When one considers the early date of these districts, for instance, the Silver Crown district of Laramie County, and the comparative ease with which they can be reached, it is still more surprising.

CARBON, ALBANY, AND LARAMIE COUNTIES.

The Medicine Bow Range of southeastern Wyoming is a continuation of the Front Range of Colorado, which spreads out into two forks as it enters Wyoming and forms the mineral-bearing section of Carbon, Albany, and Laramie counties, lying immediately north of Colorado, which are here taken together.

The principal interest at present centers in the copper mines of this section, found in the Medicine Bow Range and Encampment Mountains, which were probably one general uplift, now separated by the cutting of the Platte Valley, which, according to Prof. S. F. Emmons, has occurred in comparatively recent times.

These mountains, unlike those of Colorado and other ranges in Wyoming, do not show an Archean core, but distinctly sedimentary beds, mainly quartzites of pre-Cambrian age, form the crests of the ridges of both groups, while the intermediate Platte Valley consists of granites and gneisses, like the so-called Archean of Colorado, and the sedimentary rocks are not found.

The whole of these sedimentary ranges, which, while mainly quartzites, sometimes show beds of limestone and conglomerates, are compressed into folds having an east and west strike, all highly metamorphosed.

The principal value of the mines found lies in their copper contents, but as they all carry a little silver and gold, which finally finds its way way into the production of the country as such, they are here noted.

The occurrence of platinum, and perhaps palladium and other rare metals, associated with copper at the New Rambler mine was announced by Prof. Wilbur C. Knight. It was further examined by H. O. Wells and S. L. Penfield, of Yale University. It occurs in well-defined crystals (sperrylite), in association with covellite and pyrite. The occurrence of platinum in definite mineral combinations is so rare that its discovery here seemed likely to add considerable importance to the district, hence an examination was made during the past year by S. F. Emmons, of the United States Geological Survey, and I have availed myself of his paper.

There is no doubt that platinum and perhaps other rare metals occur in this section, but the extravagant claims sometimes made are to be entirely disregarded, and the production, in my opinion, of commercial platinum, is not to be expected.

The gold and silver value of the New Rambler mine is extremely small in comparison with the copper value. It is probably not more than from 3 to 5 ounces in silver and one-tenth of an ounce in gold.

NORTH AMERICAN COPPER COMPANY, GRAND ENCAMPMENT.

Those who have the development of this section in charge have the greatest confidence in its future, and the principal interest has centered around the town of Grand Encampment.

The properties heretofore known under the general name of the Ferris-Hagerty, have been merged into a grand corporation known as the North American Copper Company. It is claimed that the Ferris-Hagerty mine has blocked out and in sight many thousand tons of copper ore, all carrying small amounts of gold and silver, as well as plantinum and other rare metals. This company has completed during the year the longest suspension tramway in America, also a pipe line 4¼ miles long to bring water from the South Fork of the Encampment River.

To show the scale upon which this company operates I may mention that it controls the following auxiliary companies: The Encampment Smelting Company, the Encampment Tramway Company, the Encampment Water Works Company, the Encampment Pipe-Line Ditch Company, the Encampment Land and Town Lot Company, the Encampment Lumber and Transportation Company, the Emerson Electric Light Company, the Haggarty Copper Mining Company, the Carbondale Coal Company, the North American Bank and Trust Company, and the North American Bank Building Association.

The North American Copper Company have enlarged their smelter to 300 tons daily capacity and have added to their plant a concentrating mill, converters, etc.

THE COPPER BAR MINING COMPANY.

This company's holdings are located 23 miles southwest of Encampment. The mine is equipped with a small steam hoist. The shaft is down 180 feet.

THE ÆTNA MINING COMPANY.

The property of this company is located 9 miles southeast of Encampment. The workings consist of a tunnel about 200 feet in length, which cuts a vein of considerable promise. Several parallel ore shutes have been traced upon the surface.

SYNDICATE COPPER MINING COMPANY.

This property is developed by a 180-foot shaft and an 80-foot cross cut. It is equipped with a small hoist. The surface ore shows gold values of from $2 to $4. The bottom of the shaft carries copper ore with small gold and silver values.

VERDE MINING AND MILLING COMPANY.

The property of this company is situated near the town of Battle. The development work consists of one shaft 115 feet deep and another of about 40 feet. The vein is large and well formed, and can be traced across the property. The gold values are reported from $6 to $15 per ton, and from 3 to 24 per cent copper. The shaft is equipped with hoisting machinery sufficient for immediate purposes.

CHICAGO VENTURE MINING COMPANY.

This property is developed by a 115-foot shaft, and the vein carries copper sulphides in various forms.

The gossan or outcrop is said to have a gold and silver value of $10 per ton.

CHARTER OAK GROUP.

This group is located on the eastern slope of the Sierra Madre Range, 15 miles from Saratoga. It is owned by an English corporation and is managed by Mr. J. B. Hassett, residing at Saratoga. The mine has a hoist and the workings consist of an inclined shaft 418 feet deep and several drifts upon the vein. The ore value is reported 10 per cent copper, $4 in gold, and 2 ounces in silver per ton.

KURTS CHATTERTON.

This property belongs to the Big Creek Mining Company of Pearl, Colo. A tunnel 1,700 feet long taps several large veins of ore. Machinery for sinking to a depth of 500 feet is being added. The company also owns a concentrating mill of 35 tons capacity daily.

ELK MOUNTAIN MINING COMPANY.

This property is developed by a shaft 275 feet deep, and develops a body of copper sulphide carrying some gold. It is located south of Saratoga.

BLANCHE MINING COMPANY.

This company owns 5 claims adjoining the new Rambler mine. At a depth of 100 feet the Grey Eagle vein reports the usual iron and capper pyrites, but with gold values from $1.50 to $12.50 per ton.

THE STRONG MINING COMPANY.

The property of this company consists of the Swigart-Strong group of 8 claims, located 12 miles northeast of Laramie City. The main shaft is down 130 feet on an ore chute carrying the ordinary sulphide copper ore with about 3 ounces of silver per ton. The gold values are small and uncertain, but are reported from traces to $2.40 per ton.

ITMAY GROUP.

This group is located on the Continental Divide, 4½ miles from the town of Battle. It is developed by a 75-foot shaft, and the ore body is reported to carry from 15 per cent upward in copper and over one-half of an ounce in gold per ton.

THE BUCKEYE ENTERPRISE COMPANY.

This property is located 10 miles from the New Rambler mine, and their holdings comprise four lode claims and three placer claims upon French Creek, showing the ordinary ores.

THE MICHIGAN.

This group of five claims is equipped with hoisting machinery. The shaft is down 255 feet. The ore yields free-milling gold in the gossan to a depth of nearly 200 feet, at which point sulphide ores make their appearance and are reported to assay one ounce of gold per ton.

GOLD DUST.

This group of five claims adjoins the Michigan. The surface is free-milling, but, like the Michigan, will doubtless give way to sulphide ores with depth.

DOUGLAS MINING COMPANY.

This company owns eight claims about 1½ miles from the New Rambler. The property is equipped with a hoisting plant. The ores are the ordinary copper sulphides, running from 10 to 30 per cent copper. They also claim from $6 to $30 in gold as well as from two to three ounces of silver per ton.

ANNIE MINE.

This property consists of two claims belonging to the Wyoming Queen Company. They are opened by a tunnel driven in 138 feet. A shaft also is being sunk upon the ore body. The vein as a whole probably carries 6 per cent copper in addition to gold and silver values, and is considered a good prospect.

HECLA GOLD AND COPPER MINING, MILLING, AND SMELTING COMPANY.

The holdings of this company are at Hecla, 5 miles from Granite Canyon station on the Union Pacific Railroad, and comprise 16 claims of 20 acres each, beside town site and smelter site. They have a 15-stamp mill with Cammet tables, leaching tanks, etc., and an antiquated matte smelting plant. It is claimed that the ore runs from 5 to 15 per cent copper, $7 in gold, and three ounces in silver. The property is owned in Denver.

THE FAIRVIEW GROUP.

These mines are operated by the Globe Copper Mining Company, of Colorado Springs, and comprise 429 acres located 2½ miles from Hecla. The shaft is down 140 feet and is equipped with a small hoisting plant. The ore carries gold, silver, and copper values.

ARIZONA GROUP.

This, formerly known as the Copper King property, is located 1½ miles southwest of Hecla, and is probably the best known of any group in Silver Crown district. The shaft has been sunk to a depth of 160 feet. From the bottom of the shaft crosscuts were driven 120 feet without disclosing walls, and are said to have shown values of from $7 to $8 in gold and copper, while picked specimens are said to have yielded as much as $200 in gold to the ton.

There are many other mining properties in the above described sections that are of equal promise, among which may be mentioned the Moon-Anchor, Fremont, Crede, William Penn, Hidden Treasure, Bonbright, Doane-Rambler, Aksarben, Gibraltar, and Constantine Copper Company.

In addition to the copper mines carrying gold and silver, there are in this section large areas of gold-bearing gravels which will some time add very materially to the riches of this State.

FREMONT COUNTY.

There is a very promising free-milling gold district located in the southern part of Fremont County, in the neighborhood of Lewiston and Atlantic City, known as the Atlantic mining district.

Among the more promising properties may be mentioned the Carissa, which operates a 10-stamp mill, and the Dexter Mining and Development Company, which owns the Bryan and St. Louis mines, and have under bond the Victoria Regina and Buster mines. These last two are reached by the Huff tunnel and are reported to have yielded, some years ago, $250,000.

The Silent Friend No. 1 and the Silent Friend No. 2 are promising claims owned by Mr. William Geissler. Two lots of ore shipped to Denver are reported to have returned in gold $8.40 and $64 per ton, respectively.

The Hidden Hand mine at Lewiston is credited with yielding ore of high grade, as well as the Coin mine, which is said to carry ore of extraordinary richness.

Schnitzel and Moody, of Lead City, S. Dak., the latter for many years chief engineer of the Homestake mine, have located gold mines in the Wind River section in western Wyoming, which are claimed to have extraordinary value. The Shoshone Indian Reservation also is reported to have free-milling gold veins of value. Samples said to have come from there were shown me, carrying free gold, which, if fairly taken, indicate a mine of great richness.

BIG HORN COUNTY.

In Big Horn County, ore of good grade has been discovered. Three samples received during the past year at the Golden Smelting Works gave the following results: No. 1, 38.8 ounces silver, $2.40 in gold; No. 2 (lead ore), 30.3 per cent lead, 34 ounces silver, 9.7 per cent of copper; No. 3 (a copper ore), 25.9 ounces silver, $1.60 in gold, and 2 per cent copper.

These were from a district entirely unprospected and where no locations had been made, situated not far from the present terminus of the B. and M. Railroad.

Other mines have been uncovered near Basin City whose value is mainly copper, but, like those of the southern section, carrying some gold.

The extension of the Burlington Railroad into western Wyoming can not fail to have a beneficial effect upon the many mining prospects already known. The investment of large capital in the three southern counties first mentioned will doubtless stimulate mining there, but it must not be forgotten that precious metal mining nowhere in Wyoming has passed the experimental stage, nor can it be said that so far is there a developed, steadily producing mine within the State.

PART III.

PRODUCTION OF GOLD AND SILVER IN FOREIGN COUNTRIES.

PRODUCTION OF GOLD AND SILVER IN FOREIGN COUNTRIES.

[Arranged geographically.]

NORTH AMERICA.

BRITISH NORTH AMERICA.

According to the preliminary Summary of the Mineral Production of Canada for 1902, published by the geological survey, British North America in that year produced gold to the value of $20,741,245, equivalent to 1,003,358 fine ounces. Of this amount 701,438 fine ounces are attributed to the Yukon. The output of British North America in 1902 as compared with that of 1901 decreased 163,859 fine ounces.

As the decrease in the production of the Yukon was 169,312 fine ounces, the yield in 1901 having been 870,750 ounces, there was a gain in the balance of British North America of 5,453 fine ounces.

Annual Production of Gold in Canada.

Calendar year.	Fine ounces.	Value.
1887	57,465	$1,187,804
1888	53,150	1,098,610
1889	62,658	1,295,159
1890	55,625	1,149,776
1891	45,022	930,614
1892	43,909	907,601
1893	47,247	976,603
1894	54,605	1,128,688
1895	100,806	2,083,674
1896	133,274	2,754,774
1897	291,582	6,027,016
1898	666,445	13,775,420
1899	1,028,620	21,261,584
1900	1,348,720	27,880,518
1901	1,167,216	24,128,503
1902	1,003,358	20,741,245

(Calculated from the values at the rate of $20.67 per ounce.)

According to reports from the several provinces, the production was as follows:

Yukon	$14,500,000
Ontario	229,828
British Columbia	5,961,409
Nova Scotia	546,963
Quebec	3,000
Saskatchewan River	18,000
Total	21,259,200

It will be seen, however, that there is a discrepancy between the total and the preliminary estimate of the Canadian Geological Survey, of $518,055, or, approximately, 25,000 fine ounces.

SILVER.

The silver production in 1902 was 4,373,000 ounces of the commercial value of $2,280,957, at 52.16 cents per ounce, which is a little below the average price of 1902; it is therefore assumed that the product was not quite fine; the valuation would indicate, at 53 cents per ounce, 4,303,693 fine ounces, which is assumed to have been the yield for that year. As compared with the output of 1902, there was a decrease of 939,004 ounces or $864,658 in value.

BRITISH COLUMBIA.

From the annual report of the minister of mines for British Columbia it is learned that in the year 1902 that province produced 290,148 ounces of gold, of the value of $5,961,409, which would be equivalent to 288,383 fine ounces. The gold as reported, therefore, was 0.993 fine. As compared with the yield of the previous year there was a gain of 31,091 fine ounces, or, approximately, 12 per cent. The output was the largest in the history of the province. In 1902 the lode mines yielded 236,470 fine ounces and the placer deposits 51,913 ounces. The former have rapidly increased in productivity during the last ten years, and the latter also show a gain over all years since 1879, with the exception of the years 1899 and 1900.

Since 1858 the placers of British Columbia have produced 3,100,644 ounces of fine gold and the lode mines, since 1893, 1,066,656 ounces, a total of 4,167,300 ounces. The placer gold contains from 10 to 25 per cent silver, but its value has not been separated from the totals, as it would be insignificant.

The placer mines showed in 1902 an increased production over the previous year of about 10.5 per cent, which, it is stated, would have been much greater but for lack of water.

The total amount of silver produced by the province in 1902 was 3,917,917 ounces, valued at $1,941,328, which would represent 3,662,883 fine ounces, a decrease as compared with the output of 1901 of 1,145,000 fine ounces. Of this total amount about 25 per cent was mined in association with copper, while the remaining 75 per cent was derived chiefly from the silver-lead ores of the Slocan district and of East Kootenay. Since 1886 the mines of British Columbia have yielded silver to the value of $18,475,882.

British Columbia Notes.

[From the Mining Journal, Railway and Commercial Gazette, London, February 21, 1903.]

The prduction of placer gold did not increase very much during the year, as a considerable gain of yield in Atlin will be found to have been largely counterbalanced by a falling off in the output of the gold gravel mines of Cariboo, whose work and yield suffered greatly from lack of water for hydraulicing, the result of a dry winter season up country, with little snowfall. The gold placer yield, estimated at $970,000 in 1901, probably did not exceed $1,000,000, or about £200,000, in 1902.

Gold got by lode mining, the output of which was valued at $4,348,603 in 1901, will probably be found to have reached at least $5,000,000, or rather over £1,000,000, last year, as a result of considerably increased aggregate outputs from Rossland and Boundary, respectively; to a partial extent, however, counterpoised by rather less returns than those of 1901 from the free milling and concentrating mines of the Nelson district, which includes Ymir.

Hence, the gold yield of the province last year will be found to have reached a total of about £1,200,000, the largest in British Columbia's record. The silver output, $2,884,745 in 1901, will, it is expected, be found to have declined, as a result of chiefly of falling values. Probably $2,500,000, or approximating £500,000, will represent the yield of 1902.

ONTARIO.

According to the report of the bureau of mines of Ontario, that province in 1902 produced 13,625 ounces of gold, of the value of $229,828, which would represent 11,118 fine ounces. The gold as reported, therefore, was approximately 0.814 fine.

The silver yield for the same year ammounted to 96,666 ounces, valued at $58,000 at 60 cents per ounce, but insomuch as the average price of silver during that year was only 53 cents, the value of the output must be reduced to $51,233.

It wil be seen from the appended table that the gold production of Ontario has decreased rapidly in recent years:

Year.	Gold.	Silver.
1898	$275,078	$51,960
1899	424,568	65,575
1900	297,861	96,367
1901	244,443	84,830
1902	229,828	51,233

NEWFOUNDLAND.

This bureau is indebted to Mr. James P. Howley, director of the geological survey of Newfoundland, for the appended statement regarding the gold mining industry of the province:

> As a matter of fact there is as yet (January 15, 1903) no direct production of gold in this country, though it is known to be auriferous. During the past year two gold mines have been opened up with very promising showing, but the work done to date is only of a preliminary nature, and as yet no stamp mills have been erected, though they are now on the ground. Many very rich specimens of gold quartz were discovered last year.
>
> The only production of gold thus far has been obtained from the cupriferous pyrites of Tilt Cove mine during the process of smelting the ore. All that, however, is done out of the country, and it is impossible to obtain particulars of the gold and silver produced. It is known, however, that the ore averages about 1.5 pennyweight of gold to the ton. The output of ore in 1902 was 69,737 tons.

In a subsequent letter Mr. Howley states:

> That the ore shipped last year averaged only 3.45 per cent metallic copper, or, say, 77 pounds per ton; the 69,737 tons of ore would thus contain about 2,397 tons of metal of 2,240 pounds. I have been informed on good authority that the metal averages about 2 ounces of gold per ton, which would indicate a yield of 4,794 ounces. I have no means of ascertaining what loss there is in smelting, and in order to be well within the mark I have assumed in my own estimates 4,000 ounces of fine gold as the probable result.

Newfoundland's gold yield for 1902 is accordingly placed at 4,000 fine ounces, of the value of $82,687.

NEWFOUNDLAND MINING IN 1902.

[From the Engineering and Mining Journal, New York, February 14, 1903.]

* * * * * * *

During the year some promising gold finds have been made, and two mines are now in actual operation. One at Rose Blanche, on the southern coast, and the other at Sops Arm, in White Bay, on the northeast coast. Both are only in the preliminary stages at present, and neither has a mill erected, although the machinery for stamp mills is now on the grounds. A number of miners are employed at each locality opening the mine and getting out quartz.

The ore at Rose Blanche is said to be low grade, the yield being $4 to $5 per ton, but there is an enormous body of quartz. At Sops Arm the gold is free, and sometimes quite coarse, while some tests went from $10 to $15 a ton. The prospects are very good, and it is quite probable that some production of gold from one or both of these mines will be recorded in 1903.

NOVA SCOTIA.

According to the report of the department of mines of Nova Scotia, that province in 1902 produced 28,279 ounces of gold. Its fineness is not given, but insomuch as the yield of 1901, which, in the same report is stated to have been 30,537 ounces, and in the report of Mr. Robert Bell, acting director of the geological survey of Canada, for 1901, is valued at $546,963, which would represent 26,459 fine ounces, the fineness for that year was 0.866+. Assuming that the fineness of the output was the same in 1902 that it was the previous year the yield was 24,490 fine ounces, of the value of $506,253. There was a decrease in production in 1902 as compared with 1901 of 1,969 fine ounces, or $40,703.

In 1902 the amount of ore crushed was 192,076 tons, and the average yield per ton was 5 pennyweight 13 grains.

From 1862 to 1902, inclusive, Nova Scotia has produced 779,675 ounces of gold, valued at $14,813,814 (at $19 per ounce). The yield for this period, therefore, averaged 0.919 fine and consisted of 716,618 fine ounces.

MEXICO.

Answering this Bureau's interrogatories, Mr. Fenton R. McCreery, United States chargé d'affaires ad interim at the City of Mexico, states that the gold production of the Republic is estimated to be equal to the amount coined together with that exported—coin being omitted from statements of the latter, which would be for 1902—15,277 kilograms, of the value of $10,318,384, at the Mexican valuation of $675.416 per kilogram, which it should be noted is not the commercial value, which is $664.60, but the amount with which persons who enter the precious metals are credited for gold. The credit for silver is $40.915 per kilogram. These amounts are prescribed by law (see the Mexican Financier of May 18, 1895, quoted in the Report of the Director of the Mint for 1894). At $664.60 per kilogram, the product would be worth $10,153,094, or $131,748 less than the previous year's yield.

The silver production, estimated in the same way, amounted in 1902 to 1,876,097 kilograms, of the Mexican coining value of $76,760,535, at $40.915 per kilogram. The commercial value at $17 per kilogram—the average price during 1902—would be $31,893,649, representing (at 53 cents per ounce) 60,176,696 ounces. There was, therefore, an increase, as compared with the yield for 1901, of 2,520,147 fine ounces, but a decrease in value, owing to the sharp decline in silver, of $2,706,670.

Appended is a table containing this Bureau's estimate of Mexico's production of the precious metals from 1873:

PRODUCTION OF GOLD AND SILVER FROM THE MINES OF MEXICO, 1873–1901.

Years.	Gold.		Silver.	
	Weight.	Value.	Weight.	Coining value.
	Fine ounces.		*Fine ounces.*	
1873–1894	[a] 995,888	$20,586,800	586,615,198	$758,451,984
1895	290,275	6,000,000	46,971,407	60,719,500
1896	403,081	8,331,700	45,651,832	59,017,600
1897	362,812	7,500,000	53,913,139	69,693,000
1898	411,196	8,500,000	56,748,479	73,358,200
1899	376,927	7,791,770	50,395,125	65,145,000
1900	392,262	8,108,784	61,835,092	79,936,636
1901	497,521	10,284,842	57,656,549	74,545,839
Total	3,729,962	77,103,896	959,789,821	1,240,867,759

[a] From 1873 to 1876 the gold production of Mexico was included in Central and South America's product.

It will be noticed that not until 1895 did Mexico's gold production become important and that it steadily increased up to 1901, the yield for that year having been the largest in its history.

The production of silver has rapidly increased in Mexico since 1873, the yield for 1902 in fine ounces having been, with the exception of the product for 1900, the largest on record.

NOTES ON THE PARRAL DISTRICT, CHIHUAHUA, MEXICO.

[Written for the Mining and Scientific Press by H. Z. Osborne, Los Angeles, Cal.]

Parral, or Hidalgo de Parral, is in the southern end of the State of Chihuahua, and the center of one of the most productive mining sections of the Republic of Mexico, which the writer visited last winter. The city is essentially Mexican in its architectural character and citizenship, and in the entire district there are probably less than 1,000 foreigners, of whom the Americans are the most numerous. Parral is built immediately about some of the oldest mines—the hill on which they are situated, called Cerro de la Cruz, or Hill of the Cross, being partly in the city. Infact, it was these mines that first brought the village into existence three hundred years ago, and some of them have been worked with occasional interruptions until the present day. The Jesus Maria is one of these, and it is credited with a production of $7,500,000 in silver with a little gold. The vein is said to average 16 feet in width, and to have been worked to a depth of 250 feet. The Prieta is the most conspicuous mine on the hill, and while it has been worked a great length of time it has attained a depth of but 377 feet.

The most productive mines of the Parral district, however, are not immediately in town. The Veta Colorado, or Red Vein, is north of Parral and extends in a northerly direction several miles. This is one of the great veins of the world, although it lacks the remarkable length of the mother lode of California, or that of the reefs of the Witwatersrand of South Africa. In fact, the known mines are confined to a length of 3 or 4 miles on the vein, but they are continuous one after another. The red color of the vein, which is in porphyry, can be seen for a long distance, stretching along the west side of the summit of a range of hills from 500 to 800 feet high. The product of the mines is almost exclusively silver with a little galena in quartz.

The large percentage of silver in the ores, associated as it is with some lime and iron, makes them particularly desirable for fluxing the baser silver-lead ores of other Mexican districts. To such an extent is this the fact that, notwithstanding several companies have large reduction works at their mines, the big smelters were offering such inducements to the miners in the way of low freight and smelter charges that their own works were generally closed, and nearly all the ore was being shipped to the big smelters.

The principal productive mines of the Veta Colorado are at the southern end of the lode, which extends nearly north and south for a distance of 7 or 8 miles. The best mines cover a length of 2½ miles on the lode, and embrace, from south going north, La Esperanza, La Morena, El Nopal, El Salto, La Presena, Alfarena, El Verde, Veta Grande, Quebradillas, Los Muertos, and Terrenates. The lode is owned for miles north of the Terrenates, but less work has been done in these mines, and less values produced. The vein is very wide at the surface, from 50 to 300 feet, but the vein is by no means all ore. The ore occurs in successive shoots, from 100 to 200 feet long and from 1 foot to 60 feet wide, generally largest near the center of the shoot, and the shoots are usually several hundred feet in depth. In La Presena a large lens of ore, carrying 120 ounces silver, was found 40 feet outside the hanging wall of the vein proper, between the 400-foot level and the surface.

The oldest mine on the lode is the Veta Grande, discovered in 1645 and worked almost continuously ever since. The Veta Grande and El Verde have always been worked as one property, and were recently purchased by the Guggenheims. The main shaft is down 1,000 feet on the incline of 52 degrees. All the shafts on the lode are inclines, and all are sunk at about the same angle.

La Morena is 900 feet deep, with no water, and with a fine body of ore, from 10 to 15 feet wide, on the lower level.

La Presena is down 927 feet and is pumping considerable water. It produces from 1,000 to 2,000 tons per month.

La Alfarena is down about the same depth as La Presena, and the levels between the two mines are connected. Both are owned by the Hidalgo Mining Company, a Pittsburg, Pa., corporation, which operates more and larger mines in the Parral district than any other company. James I. Long, who is also the American consul, and his brother, Robert J. Long, are the managers of the Hidalgo Mining Company, which also owns and operates the Parral and Durango Railroad.

The Quebradillas adjoins the Veta Grande on the north, and has a shaft 850 feet deep. While this mine has been operated intermittently for a century, its greatest production has been during the past six years, in which a profit of more than $1,500,000 Mexican has been realized.

Los Muertos is next north of the Quebradillas, and is down 725 feet. It has a fine ore body and produces 2,500 tons per month.

The Terrenates is north of Los Muertos, has a shaft 460 feet deep, and is reported to have recently developed a rich ore body.

Enough has been said to show the importance of the great Veta Colorado. Parral has many mines, however, and some of them very valuable, that are not on the Veta Colorado. El Refugio is one of these. This mine is at Minas Nuevas on two veins parallel to the Veta Colorado, but 600 feet west of it. The shaft is down 700 feet. The principal vein is nearly vertical. It was from 1 to 5 feet wide in the upper levels and from 15 to 20 feet wide in the lower levels carrying from 70 to 100 ounces silver ore. Extensive reduction works have been constructed on the property for treatment of ores by the lixiviation process. Near by the Hidalgo Mining Company have two large mills employing the same process.

Much has been printed about the Palmilla mine, or rather about its owner, Pedro Alvarado, the "peon millionaire," as he is called. Alvarado, who has become very wealthy the past few years from the output of the Palmilla, is credited with having made an offer to President Diaz to pay the Mexican national debt. While Alvarado has made a large amount of money, it is doubtful whether he ever made the offer credited to him, and it is certain that he could not have "made good" if such an offer had been accepted. Neither was Alvarado really a peon. The Palmilla mine was owned by his father before him, but had never been an excessively rich property, although it is one of the historical mines of the Parral district. Pedro was working it in a limited way in 1900 and encountered a fabulously rich ore body, from which he has taken a handsome fortune. There are no reduction works on the mine, and all the ore is shipped to the smelters. Gold predominates in the product, although there is some silver.

The San Juanico is another rich gold mine with an ancient history. This mine is about 4 or 5 miles northerly from Parral and a mile east of the Palmilla. It was worked by the "ancients" down to the water level, about 200 feet, and great values are said to have been taken from it. It remained idle for more than half a century, when the Long brothers purchased it and equipped it with modern machinery, including a powerful pump and hoist. There are four parallel veins, all within a width of less than 100 feet, varying in width from 3 to 15 feet. The ore is high grade, averaging 2 ounces gold and from 20 to 50 ounces silver per ton. Since my visit to the San Juanico I am informed that the vein was crosscut at a depth of 300 feet, and 7 feet in width of bonanza ore was found that would average several hundred dollars per ton.

There are scores of mines at Parral and in its neighborhood well worthy of mention and several reduction works. The Parral Milling Company has two mills, one employing the lixiviation process and one concentrating. F. Stallforth Hermanos y Cia have a large patio reduction works.

Santa Barbara, about 12 miles southwest of Parral, is another very productive district, although its ores are not of high grade. This place was, more than three centuries ago, the capital of the province of Nueva Viscaya, which included the present States and Territories of Chihuahua, Sonora, Coahuila, Texas, New Mexico, Arizona, and California. The first mineral discovered in northern Mexico was the gold ore of this place in the year 1547. The branch of the Mexican Central Railroad, which leaves the main line at Jiminez and passes through Parral, is extended to Santa Barbara. The Guggenheim Exploration Company operate the celebrated Tecolotes mine at Santa Barbara and have a concentrating mill of 400 tons daily capacity. The Montezuma Lead Company's concentrating mill is of 375 tons capacity. The San Francisco del Oro and the Parral Mine (Limited), also have reduction works at Santa Barbara.

THE WEST INDIES.

GOLD IN WEST INDIES.

[From the New York Evening Post.]

The recently reported discovery of gold in Porto Rico comes as a confirmation of previous rumors that the sands of that island's numerous rivers are auriferous. The unaccountable thing about it is that our people should have been so long finding it out, for it was well known at the time Porto Rico was taken possession of by our troops, and even long centuries before, that in its earlier years the island produced an abundance of the precious metal. As soon as our authority was established in the country a member of the Geological Survey at Washington hastened to the island for the ostensible purpose of examining into its resources, but came back without bringing anything of value.

However, there is gold in Porto Rico. There was gold there before its discovery by Columbus in 1493, as the golden ornaments of the natives proved. When, in 1508, Ponce de Leon, the famed seeker after the Fountain of Youth, first reached the island he was hospitably entertained by the Indian cacique, Agueynaba, who presented him with fine specimens of gold obtained from the river beds in the western part of the island. Ponce was so excited that he could hardly rest until he had sent to Santo Domingo, the island whence he had invaded Porto Rico, for soldiers to accompany him in his search for gold in the interior. It was gold that he was after, as well as Columbus and all the other Spaniards of their time, and that they got the precious metal in quantities the official records of the Spanish Government attest. The city of Caparra was founded in 1510, but owing to the strong desire of the Spaniards to search for gold it was practically without inhabitants during the first two years of its existence, since every able-bodied man was sifting the sands of the rivers that came down from the mountains. The Indians were impressed at the very outset, and soon all those who came within reach of the white men were aiding the Spaniards in their investigations. At last it became so unbearable that Cacique Agueynaba resolved to either put an end to Spanish oppressions or himself receive his quietus.

He had been told that the Spaniards were immortal, and for a time he believed it, seeing them come up out of the sea in almost endless processions; but, like the canny Scotchman who lived in story afterwards, he had his "doots" at last, and resolved to test the theory by an original application of the water cure—that is, he captured a Spaniard alone in the mountains and held his head under the water of a stream for two or three hours. Then he took him to the bank and sat beside him for two days, or until he received incontestable evidence of his demise. Such heroic treatment put an end for a time to gold hunting in Porto Rico, for, the Spaniards resenting it and getting after the cacique, an insurrection followed, which was not put down until the Indians were practically exterminated.

Still, traditions of gold in the island lingered through the centuries, the stories stimulated every now and then by rich finds by natives who washed the sands in a shiftless manner with the wooden dishes and without system. There are, in fact, people living in Porto Rico to-day who gain a livelihood by gold washing, pursued in just the same way as their ancestors before them followed it and as it is carried on also in the adjacent island of Santo Domingo.

It was in Santo Domingo really that the first gold was discovered by white men in America, for though Columbus had seen gold in the Bahamas and in Cuba in the shape of nose and ear ornaments worn by the natives, the latter always pointed to Haiti or Santo Domingo as the home of the precious product. When he finally arrived off the coast of Haiti, in December, 1492, he was given a great deal of dust and some nuggets, and when he finally reached the bay of the present Cape Haitien he found himself on the threshold of the golden country, the "Cibao" of the Indians. From its resemblance to the word Cipango, mentioned in the book of Marco Polo as a rich land of the east, Columbus concluded the two were identical, and for a time imagined himself just on the borders of the Great Khan's dominions. The Great Khan was the potentate described so affluently by Marco Polo, and whom Columbus for a while thought he perceived in the Haitian cacique Guacanagari. This generous Indian received Columbus with hospitality, giving him all he had, in fact, of gold as well as of provisions and fair maidens. He gave Columbus a golden mask with ears and tongue of beaten gold, and even took from his own head the golden crown he wore and presented it to the stranger. His companion caciques also did the same, and so abundant were the signs of gold in this section that Columbus wrote in his journal, for his sovereigns' delectation, that he fully expected to obtain a ton of gold during his stay with Guacanagari.

As the caravels of Columbus lay in the harbor the simple natives swam out from shore or approached in their canoes, holding up to view great nuggets of gold and crying out, "Chug, chug," meaning thereby that they wished to exchange them for hawks bells of bronze or brass, which made tinkling noises that ravished their ears, though worth but a few cents apiece; and so fearful were some of these Indians that the Spaniards would repent of their bargains and pursue them with intent to take away their bells that they swam or paddled ashore in great haste and fled into the forest. After leaving Guacanagari, sailing eastward, Columbus first found gold *in situ* in the sands of the Yaqui River. It was on an evening in January, 1493, three hundred and fifty-five years before the discovery of gold in California, that some sailors of his caravel found particles of gold clinging to the hoops of their water casks while filling them at the mouth of the river. The sands of this river were examined and found to be glittering with flakes and particles of gold, so Columbus named the stream the Rio del Oro, or River of Gold, though it was called by the natives and to-day is known as the Yaqui. Being in a hurry to return to Spain, Columbus did not linger to explore the river, but continued on his voyage homeward, leaving word for the soldiers in garrison at Navidad, in Guacanagari's country, to investigate. The place where the first gold was found in America is not far from Monte Cristi, on the north coast of Santo Domingo.

Returning to the island in the latter part of 1493, Columbus, as soon as he had well laid the foundations of Isabella, the first town of European origin in America, sent an expedition inland to explore and search for gold. This expedition penetrated to and ascended the valley of the Yaqui and returned with gold, which was sent back to Spain with the fleet early in 1494. You may find in Spain to-day traces of the first gold sent there by Columbus in a church in Burgos and in another in Granada.

The Spaniards found the gold not only in the river sands, but in pockets—surface indications which give color to the theory that the real source of the treasure has never been touched. This source is in the mountains, in the central cordilleras of Santo Domingo, and, as in the Klondike, what has been found was only the washings from the heart in the hills or the mother veins of the mountains. It was declared by Humboldt many years ago that while the Spaniards freighted their galleons with gold from Mexico and the West Indies for years, yet they had never tapped the fountain head.

The great gold district of Santo Domingo is in what is known as the Cibao, an elevated region with delightful climate and situation for a settlement, yet far from the coast and reached only by rough roads. The nearest settlement of importance is Santiago de los Caballeros, situated on the bank of the Yaqui, which is connected by a railroad with the coast at Puerto Plata. There are few rich people in Santiago or anywhere in that section, the population being incredibly shiftless and improvident. Those who live in the gold region wash out in a few hours enough to suffice their needs for a month or so, then desist from all work until the proceeds of their labor are expended. The general results are gold dust of good quality, with now and then a nugget of large size. The writer once saw a handful of fine nuggets obtained from the Cibao rivers by washing with primitive apparatus consisting merely of a wooden dish or calabash. The largest of these nuggets weighed 5 ounces, and there were several weighing an ounce each, the writer securing a nugget that weighed half an ounce, which was one of many. He may also add that he has some grains of Cibao gold before him as he pens these lines.

The same conditions prevail in Porto Rico as in Santo Domingo, though gold washing in the former island has not been so persistently carried on as in the latter, where the rivers are less numerous, but at the same time larger.

It is safe to say that the mineral resources of Porto Rico have not yet been fully exploited, though the rivers may no longer pour down golden sands, as of yore. It is in the heart of the mountains, in the great Luquillo range, that search should be carried on, where many of the rivers running to the coasts have their origin. In a report printed more than a hundred years ago, in the year 1788, it was stated that signs of gold were found in several districts of the island, and auriferous sands in such rivers as the Luquillo, Sebuco, Daguao, Manaron, and Mayaguez. In a work on Porto Rico, issued by the writer in 1898, he stated: "Though there may not be any large area of Crown lands available for newcomers, there will still be a chance for the prospector, and possibly great discoveries may be made. His only expense, if he pursues the primitive operations of the natives, will be a wooden pan or calabash costing a few cents, and the food necessary for his subsistence while wading the tropic streams. At all events, if little gold reward the prospector in Porto Rico's mountains, he will not be subjected to the rigors of an arctic climate, nor have to endure the severities of a trip to the Klondyke. He will be able to work all the year through, if so inclined, the worst of his foes being mainly avoidable, such as malarial fevers, poisonous insects, and torrential rains." If it, indeed, be true that good "color" has been found in the placer deposits of Porto Rico, a stampede may be predicted to that insular region which will tax the resources of the steamers running to that island.

Gold has been found in other islands of the West Indies, as in Cuba, near Santiago, in the Virgin Islands, etc., but not in paying quantities within two centuries and more. The West Indian gold fields of the future lie in the mountains of Cuba, Porto Rico, and Santo Domingo; though it is doubtful if more will be obtained from them than the past has yielded. Still, "Quien sabe?"

PORTO RICO.

[From the Mining Journal, London, July 25, 1903.]

According to a recent consular report, although numerous concessions for the working of many sorts of minerals have been granted since the United States occupation, no bona fide enterprise has been instituted. Surveys have been made, reports issued, and companies projected, but beyond preliminaries nothing serious has been attempted.

The question of the payable production of minerals in the island appears to be that of the capability of modern methods over old ones.

Gold can be found any day, and is in plain evidence in the Corozal district, where some of the peasants gain a livelihood by washing the sand. Concessions have also been granted for silver, of which there is ample mention in the early Spanish colonial records.

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THE CENTRAL AMERICAN STATES.

This Bureau has received no replies to its interrogatories regarding the production of the precious metals in the Central American States in 1902. It is therefore necessary to have recourse to statements of exports.

According to United States Consular Report No. 273, Costa Rica exported in the year 1902 gold bullion to the value of $127,504, gold dust worth $5,992, and gold and silver parting metal to the value of $5,984, all of which exports came to the United States. It is impossible to state what proportion of the last-named value was represented by the silver, but a deduction of $1,000 is made from the gold, for it. Accordingly the gold production of Costa Rica for 1902 is estimated by this Bureau to have been worth $139,480, which would represent 6,699 fine ounces, a gain, as compared with the preceding year's output, of 688 ounces.

According to figures compiled by the United States Bureau of Statistics, Costa Rica, in 1902, exported to this country silver to the value of

$8,075, equivalent to 15,236 fine ounces, which is assumed to represent her yield for that year.

Under date of April 18, 1903, Consul W. E. Alger reports from Puerto Cortes that Honduras, in 1902, exported metals to the value of 2,346,990 pesos, or $938,976; stating that the metals exported were:

	Ounces.
Gold	23, 235
Silver	1, 010, 204
Copper	25, 198

Eliminating the value of the copper from the total, the value of the gold and silver is estimated at $938,725, which would indicate that they were, approximately, 0.925 fine, although the fineness may not have been the same in each case. This Bureau, therefore, estimates the gold production of Honduras, in 1902, at 21,492 fine ounces, of the value of $444,279, and the silver at 934,439 fine ounces, worth, commercially, at 53 cents per ounce, $495,252. As compared with the output of 1901, there was a gain in gold of 16,033 fine ounces, and in silver of 102,447 fine ounces.

HONDURAS.

[From Consular Reports, February 7, 1903.]

The Rosario mine is the largest enterprise of its kind in the Republic of Honduras. The property, covering a zone 16 miles square, is situated in the Crucero, San Juan, and Pena Blanca mountains, some 21 miles northeast of the city of Tegucigalpa, the capital of the nation. In round figures, the mines are 100 miles from the Pacific coast—that is, from the Bay of Fonseca. To the north coast the distance is about double.

The working tunnels, as a whole, range in elevation from the upper 900-foot level to the lower 850-foot level. The zero level is about 5,500 feet above the sea, and the mills and town of San Juancito some 2,000 feet below the zero level. The workings to date have penetrated over 6,000 feet into the mountains, where the thickness of veins and ore is about 1 foot. Tramming is resorted to in all mines, with a principal trolley system in the main tunnel which receives the ore through chutes. There are levels every 100 feet.

The average output is 60 tons of dry ore a day, the monthly value reaching $75,000, or about $1,000,000 annually.

The chief-vein materials consist of quartz and various products of country rock, containing particles of iron, lead, and zinc sulphides, carrying silver and gold values. In certain sections, the sulphides are replaced by their oxidation products. A considerable part of the silver exists as sulphide. The gold is largely native and very finely divided. Native silver and silver chloride are occasionally found, and copper minerals occur in some places. Although the veins are usually found strong and carry sulphides in many places, they are not high-grade sulphides.

Mr. Louis S. Noble, M. E., who has recently made an exhaustive examination of these mines, does not believe there is any "mother lode," or that there is a general center from which the veins are mineralized.

A large part of the country in and about the Department of Tegucigalpa is composed of eruptive rock. In some parts of the foothills around San Juancito, sedimentary rocks consisting of sandstones, limestones, conglomerates, shales, and slates are to be found. As the elevation increases, andesite takes the place of the earlier formations. It shows variations in macroscopic appearance, according to the different conditions under which it is cooled. This eruptive rock is traversed by a large number of fissure veins, intersecting and joining at various angles, usually standing at a steep inclination.

Alfred K. Moe, *Consul.*

Tegucigalpa, *November 12, 1902.*

Consul Moe sends from Tegucigalpa, September 3, 1902, a report by W. Heyden, consular agent at Amapala, as follows:

"The names of mines in the neighborhood of Amapala are the Aramecina Gold and Silver Mining Company (Limited) and the Mina El Transito. The first is located at Santa Lucia, Department of Valle; the second, at El Transito, in the same department. The depth of working in the Aramecina mine is 150 feet and the annual production is 15,000 ounces of gold. The working in the other is superficial, producing $8,400 gold from January to June, 1902. The character of ore is sulphide and oxide, and oxide, respectively."

Mr. Chester Donaldson, United States consul at Managua, Nicaragua, under date of June 12, 1902, furnishes a statement of the mineral industry of that country, enumerating 41 mines in operation at that time producing annually 78,000 ounces of gold of the average value of $17 per ounce, or a total of $1,325,994, which would represent 64,145 fine ounces, and which is assumed to represent the production of the country.

The consul adds:

Besides the above, there are seven mines in Chontales and six in Leon from which I can get no figures. Probably no work is being done, except experimentally, and no gold is exported. There is also one gold mine—La Leonesa—in Matagalpa, which, although having been worked continuously for over three years in tunnelling and getting out ore, has not yet extracted or exported any gold.

There were also 64 mining claims registered during the past year, as follows:

Department of Leon	11
Department of Matagalpa	12
Department of Chontales	1
Department of New Segovia	40

The character of ore is sulphide. The natural rock is varied sandstone, volcanic rock, and granite. In the Department of Leon and also in Matagalpa the gold bed is found in very small particles in a white, chalky soft rock, and is extracted by the cyanide process only. In New Segovia and Prinzapulca, on the branches of the Rio Coco and Prinzapulca River, some placer mining is done on a small scale, and some nuggets of abont 5 ounces have been found.

In 1902 the exports of silver—which consisted entirely of bullion—to the United States were valued at $2,326, equivalent to 4,389 fine ounces, which is assumed to represent Nicaragua's silver production for that year.

The following particulars regarding the production of the precious metals in Salvador, which relate to the years 1900 and 1901, are quoted from a report made by Mr. John Jenkins, United States consul at San Salvador:

Owing to a general reticence on the part of local mine owners, it is impossible to state what each mine is producing, and only a total of the shipments of precious ores can be given for the years 1900 and 1901. The exportation of precious metals during 1900 was only $77,945, while last year (1901) the amount produced and exported reached the total of $192,735.23. Of this, very little is silver, as the ores of the mines now being worked carry only a small percentage of this metal.

According to the statement of the Bureau of Statistics, Salvador exported to the United States in 1902, gold ore and base bullion to the value of $4,166 and refined bullion to the amount of $84,048, a total of $88,206, equivalent to 4,267 fine ounces, and silver bullion to the value of $9,134, which would represent 17,234 fine ounces.

Salvador's production of gold and silver for 1902 is accordingly held to be represented by these export statistics.

Guatemala also exported a small amount of gold to the United States—refined bullion—to the value of $3,990, equivalent to 193 ounces.

The total production of the precious metals in the Central American States for 1902 is exhibited in the subjoined table:

States.	Gold.		Silver.	
	Fine ounces.	Value.	Fine ounces.	Commercial value.
Costa Rica	6,747	$139,480	15,236	$8,075
Guatemala	193	3,990	....	....
Honduras	21,492	444,279	934,439	495,252
Nicaragua	64,145	1,325,994	4,389	2,326
Salvador	4,267	88,206	17,234	9,134
Total	96,844	2,001,949.	971,298	514,787

As compared with the output of 1901 there was a gain in the gold yield during 1902 of 65,822 ounces, or over 212.5 per cent; and in silver a gain of 93,575 fine ounces, but a loss in commercial value, owing to the fall in price, of $13,013.

SOUTH AMERICA.

COLOMBIA.

Colombia is rich in gold and silver, and although the methods in mining the precious metals are primitive, considerable quantities are won. Hydraulic mining, dredging in river beds, and lode operations are carried on in the provinces of Antioquia, Cauca, Choco, Bolivar, Tolima, Panama, and Magdalena, the first three being the richest.

The Republic prepares no official statistics of her production of the precious metals. It is therefore necessary to have recourse to statements of the imports of gold and silver ore and bullion into the United States, Great Britain, and Germany, these countries receiving nearly if not all of Colombia's product of gold and silver. A small amount may go to France, but as that country in her official statements of exports does not separately enumerate the various countries of origin it is impossible to ascertain the exact amounts of gold and silver which she obtains from Colombia. These amounts, however, in any event are so small as to be negligible quantities in the estimate of the world's production.

According to data compiled by the United States Bureau of Statistics the imports of gold and silver ore and bullion from Colombia into the United States in 1902 were as follows:

	Ounces.	Value.
Gold	34,423	$711,591
Silver	50,500	26,766

The statistics of Great Britain's imports are obtained from the Annual Statement of the Trade of the United Kingdom for 1901, and are as follows:

	Ounces.	Fine ounces.	Value.
Gold	[a]95,570	87,606	$1,810,977
Silver:			
Ore	....	67,000	35,510
Bullion	....	1,572,645	833,502
Total	....	1,639,645	869,012

[a] Assumed to be 0.916⅔ fine.

According to information elicited by this Bureau's interrogatories, Germany imported no silver in 1901 from Colombia, while her imports of gold amounted to 69 kilograms of bullion which, on the assumption that it was fine, would be worth $45,857.

From the above statements it will be seen that Colombia's total exports of gold and silver, which are assumed to constitute her entire output, were as follows:

	Fine ounces.	Value.
Gold	122,029	$2,522,568
Silver	1,776,668	941,635

COLON.

[From United States Consular Report, February 5, 1903.]

* * * The only other mineral produced in this district is gold, and the operations in this metal are as yet tentative, but promise good results.

The gold mines are situated in the Portobello range of mountains, where the Antigua Indians, and afterwards the Spaniards, carried on mining in a crude and primitive way. They evidently got considerable quantities, but only what is known as free gold, apparently not being acquainted with any methods for the treatment of sulphides, as their workings stop where these come into the vein in any quantities. The mines worked by these Indians are called the Santa Maria, Santa Catalina, and El Capitan.

The rock containing the gold veins consists of clay-stone porphyry, overlaid with a heavy plate of andesite. The character of the ore is iron sulphide, very strong, and from 9 to 14 feet wide. It is oxidized for a depth of from 30 to 50 feet, but even at a depth of 100 feet a partial oxidation of a part of the vein is found. The ore runs from $2.50 to several hundred dollars per ton.

When the three mines are opened up and equipped they will produce probably about 100,000 tons per year.

The best method of treating these ores is not yet fully decided.

PANAMA.

No silver mines are being worked in this department or in the district, so far as I know. Very few gold mines are being worked, on account of the disturbed conditions which have existed for the past three years. The only large one being operated in this department is the Cana mine, about 180 miles from this city. It has been worked to a depth of 550 feet, and produces about $80,000 monthly. The total production has been several millions. The soil is soft and of a shattered formation, mostly porphyry free gold. The nature of the country rock is stratified porphyry. It assays from $40 to $60 per ton.

In the province of Veraguas, about 70 miles from the city of Panama, there are a number of small mines, but none of them has as yet been worked to any extent. However, machinery has been ordered for some of them and the owners expect to begin work very soon.

As to the Cauca and other parts of the district, it is impossible to get information. There seems to be a desire on the part of capitalists to open mines in this section, but the revolution has impeded progress. While foreigners are not molested as a rule, they must depend largely on native labor, and this is so very uncertain during these times as to make it almost out of the power of parties to operate.

There are many people waiting for the restoration of peace to begin work, especially in the Veraguas Province.

On account of the conditions existing here it is impossible to give correct figures in regard to mines. The tax on this property has been greatly increased. The cost of denouncing property for mineral purposes was formerly almost nothing; now it is $10 (about $4 gold). To denounce three pertenencias by the old law cost $5 ($2); at present it costs $500 ($200) for each pertenencia. The tax title formerly cost $10 ($4); now it is $150 ($60). The annual tax on each pertenencia was $2 (80 cents); now it is $100 ($40) for each pertenencia, whether worked or not.

For alluvial claims the annual tax for each square of 5 kilometers (3 miles) was $1 (40 cents); now it is $150 ($60). With these charges the cost of the smallest claim will amount to $250 ($100) or upward.

A comparison with the figures for 1901 reveals a decrease in the gold production of 13,484 fine ounces, or nearly 10 per cent, and in that of silver of 104,981 fine ounces, or about 5.6 per cent.

THE GUIANAS.

BRITISH GUIANA

Mr. George H. Moulton, United States consul at Demerara, replying to this Bureau's interrogatories, states that British Guiana, during the calendar year 1902, produced 103,350 ounces, or 3,214 kilograms, of placer gold, valued at $1,808,625, which would represent 87,492 fine ounces. The average fineness is stated to have been 0.930; the valuation given, however, would represent a fineness of 0.846. All the gold produced is exported to England.

There was a gain, as compared with the yield of 1901, of approximately 1,790 ounces of fine gold.

The following statement of the production since 1897, by fiscal years, is from official sources:

	Ounces.
1897–98	121, 490
1898–99	113, 114
1899–1900	112, 798
1900–1901	114, 102
1901–2	101, 332
1902–3 (estimated)	103, 350

The fineness is not stated, but on the assumption that it averaged 0.850, the total yield in fine gold for this period would be 566,258 fine ounces—an annual average of 94,376 ounces.

The following particulars regarding the gold industry of British Guiana are gleaned from the Thirteenth Annual Report of the Institute of Mines and Forests of that country:

During the year July 1, 1901–June 30, 1902, the gold industry has been marking time. The production of alluvial gold may be said to have kept up fairly well when one considers that business generally in the colony has been dull and that the cloud of depression has not lifted. Even alluvial washing requires a certain amount of capital initially, and if this be not forthcoming it can scarcely be expected that much progress will be made. Indeed, the colony has been fortunate in that, under the circumstances, there has not been a considerable decrease in its gold output for the past year. What decrease there is can be safely accounted for by the fact that a considerable proportion of the available local capital and labor has been diverted by the more alluring prospects of the diamond fields.

Although it is perfectly true that the richer parts of the regions already prospected no longer offer large profits to unskilled workers and wasteful methods of working, it is equally true that up to this we have barely scratched the surface of the gold-bearing deposits of the colony. Lack of capital and initiative have been responsible for an almost entire cesssation of properly conducted prospections, and those now engaged in the industry have settled down to take out the gold at something like half the cost per ounce that was expended and largely wasted ten years ago.

Many of the larger placers have been sublet to pork knockers, whose work being free from supervision is of necessity desultory. Most of these placers could still be worked with organized labor and modern methods at a handsome profit; but the recent general depression in the colony has had the effect of rendering credit difficult to those who would otherwise have been able to show a good production.

Although British Guiana can not point to any progress during the past year in the production of alluvial gold, there are not wanting signs that the coming twelve months will see a great increase in the gold export. The very extensive hydraulic works at Omai, on the Essequebo River, are now nearing their completion, and possibly before the end of the present year their success will give such an impetus to similar undertakings that the next year will see British Guiana moved up more than one step in the list of gold-producing British colonies.

A very large amount of money has been spent on these works, and the best available scientific and technical advice has been utilized, while some of the most powerful modern machinery used in the hydraulic process has been fitted up.

A fair idea of the value of the earth to be treated can be formed from the fact that the original owners of part of this property used to obtain as much as 1,500 ounces of gold per month by the crudest operations, conducted in the bed of the creeks draining the hills.

Given the success of this undertaking, a success which can scarcely be doubted, and one will probably see other large tracts of auriferous country similarly treated. British Guiana has, beyond all doubt, a great future as a gold-producing country—given the application of modern methods to the treatment of large tracts of alluvial deposits.

That these auriferous deposits are very extensive is proved by Professor Harrison's very careful assays of the country rock of the northwest district and of the Puruni River district—assays which show that in the northwest district the hornblende-schists carried in five localities out of eight, from which specimens were taken, 34 grains, 30, 8, 6, and 4 grains to the ton of 2,240 pounds.

These were rocks entering largely into the composition of the Aruka hills, a coast range in the northwest district, and all of them showed evidence of great regional metamorphism.

In the Puruni district, where again hornblende-schists, with diorites and amphibolites, are indicated as the main source of the metal in the principal part of the gold field, Professor Harrison gives as the result of assays made that the gnerossose rocks of the district average 6 grains, the granites, 5 grains; the diorites, 6½ grains; the intermediate intrusives and the derived schists, 2 grains, and the amphibolites and hornblende-schists, 5½ grains, with 3 grains to the ton in the diabase and proterobase.

In this connection it is interesting to note that operations have been undertaken at a profit where 1.35 grains to the ton has been taken from alluvial gravels. The value of these facts can not be overrated, showing as they do, on incontrovertible scientific evidence, that not only must the area of auriferous alluvium be very extensive, but that the great probability is that there is an almost inexhaustible field for the employment of modern methods in the extraction of the gold. The following tables will show the production of the various districts during the past year as compared with 1900–1901 and 1899–1900. Although a decrease has to be recorded in the production of alluvial gold for the entire year, the last six months actually show a slight increase, thus:

The following are the details of the export of gold from the colony for the six months ended June 30, 1901, and June 30, 1902, respectively:

Month.	1901.		1902.	
	Ounces.	Value.	Ounces.	Value.
January	9,786	$172,292	9,301	$162,855
February	6,416	111.956	6,003	104,582
March	6,219	108,372	7,822	136,724
April	8,709	153,112	8,132	141,546
May	9,379	164,489	8,499	148,757
June	6,138	105,238	7,315	127,845
Total	46,647	815,459	47,072	822,309
Increase			425	6,850

The total export of gold for the year ending June 30, 1902, was 101,428 ounces, although royalty was paid on 105,067 ounces. This practically means that there was a large amount on hand on June 30 which was not shipped until July 3.

COMPARATIVE STATEMENT OF GOLD OBTAINED FROM THE BELOW MENTIONED DISTRICTS.

Districts.	1901-2.			1900-1901.			1899-1900.		
	Ozs.	*dwts.*	*grs.*	*Ozs.*	*dwts.*	*grs.*	*Ozs.*	*dwts.*	*grs.*
Barima	18,935	8	1	16,583	14	5	16,404	14	6
Barama	9,240	10	14	8,769	19	18	8,165	14	5
Cuyuni	22,329	19	20	23,262	15	17	22,333	0	19
Groete Creek	2,482	15	1	1,824	12	21	1,384	12	3
Puruni	14,135	9	15	17,433	2	8	14,048	0	18
Mazaruni	2,451	19	19	724	6	5	2,047	8	7
Essequebo	10,056	3	20	4,884	14	23	18,487	3	22
Potaro	25,422	10	4	25,653	6	4	28,579	17	15
Demerara River	11	3	9	67	8	10	37	17	21
Berbiee				3	0	14			
Total	105,066	0	7	99,207	1	5	111,488	9	20

FINENESS OF GOLD FROM THE VARIOUS DISTRICTS.

Districts.	Purity.
Potaro	0.914
Cuyuni	.930
Barima	.920
Puruni	.932
Barama (about)	.930
Essequebo	.920
Groete Creek (about)	.915

DUTCH GUIANA.

Mr. George H. Moulton, United States consul at Demerara, states that the colony of Surinam, Dutch Guiana, produced 587.60 kilograms of gold in 1902, of the value of $322,007.60. This valuation indicates a fine contents of 15,577 ounces, and an average fineness of 0.825.

No silver is produced in the colony, nor are there any refineries.

As compared with the yield of 1901 there was a decrease in the gold produced of, approximately, 4,044 fine ounces.

DUTCH GUIANA.

OUTPUT OF GOLD IN 1902.

[From the Board of Trade Journal, London, February 26, 1903.]

In a dispatch dated January 16 His Majesty's consul at Paramaribo reports that, according to the official returns, the production of gold in Dutch Guiana in the year 1902 amounted to 587,604.40 grams (1 gram=15.432 grains).

The official returns for the previous four years, in kilograms, were as follows:

1898	864.990
1899	893.197
1900	842.272
1901	752.842

It is stated that the proposed railway from Paramaribo to the Lawa district (see Board of Trade Journal for 20th November last, p. 338) will be commenced in April or May next. This will, it is hoped, give an impetus to the gold industry, which is at present much hampered by the difficulties of transport.[a]

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[a] The fineness is not given in the above table; it is, however, estimated to have averaged 0.825.

FRENCH GUIANA.

This Bureau estimated the gold production of French Guiana for 1901 at 3,009 kilograms, an amount which, according to the Statistique de l'Industrie Minérale, should be increased to 3,152 kilograms. The expansion in the industry, which began in 1901, continued throughout 1902.

Mr. George H. Moulton, United States consul at Demerara, basing his statement upon a report of the consular agent at Cayenne, places the output for the latter year at 4,645 kilograms, as against 4,021 for the preceding twelve months. Assuming the average fineness to have remained the same (0.784), the French colony yielded 3,641.68 kilograms, or 117,080 ounces fine gold of the value of $2,420,258. There was therefore an increase compared with 1901 of 15,715 fine ounces, valued at $324,857, or, approximately, 15.5 per cent.

The most productive placers were those of Haut Maroni (Inini), 2,108 kiloggrams; Haut Mana, 1,058 kilograms, and Approuague, 629 kilograms.

The following table exhibits the production by districts:

	Kilograms.
Maroni	2,108.342
Mana	1,058.653
Sinnamary	480.598
Approuague	629.555
Oyapok	272.951
Roura	73.320
Brazil (late contested territory)	19.429
Kourou	1.128
Kaw	0.523
Tracouba	1.484
Total	4,645.983

The above figures are based upon the statements of declared exports, but the mining laws of the colony are such that a considerable amount of gold is still exported surreptitiously.

The figures for the gold product of the Guianas from and including 1897, as finally corrected from official reports, are set forth in the appended table.

	1897.			1898.			1899.		
	Kilograms.	Ounces.	Value.	Kilograms.	Ounces.	Value.	Kilograms.	Ounces.	Value.
British Guiana	3,140	100,950	$2,086,820	3,082	99,105	$2,048,700	3,070	98,712	$2,040,500
Dutch Guiana	906	29,127	602,100	856	27,532	569,100	871	23,196	479,514
French Guiana	2,311	74,299	1,535,890	2,474	79,547	1,644,400	2,541	81,691	1,688,700
Total	6,357	204,376	4,224,810	6,412	206,184	4,262,200	6,482	203,599	4,208,714

	1900.			1901.		
	Kilograms.	Ounces.	Value.	Kilograms.	Ounces.	Value.
British Guiana	3,190	102,558	$2,120,062	2,666	85,702	$1,771,600
Dutch Guiana	698	22,439	463,873	610	19,622	405,635
French Guiana	2,071	66,582	1,376,372	3,152	101,365	2,095,400
Total	5,959	191,579	3,960,307	6,428	206,689	4,272,635

VENEZUELA.

Venezuela prepares no official statistics of the production of the precious metals, and statements of her exports of gold and silver throw but little light upon the subject.

According to Mines and Quarries for 1901, the exports of gold from Ciudad Bolivar in that year were valued at £89,151, or $433,853, equivalent to 20,988 fine ounces, and in the absence of other data this figure is repeated for 1902.

Gold is obtained chiefly from the Caratal or Turuari district.

There are some silver mines in the States of Bermudes, Lara, and Los Andes, but the yield is slight.

The imports of silver from Venezuela into the United States, in 1902, amounted, approximately, to 1,887 ounces, of the commercial value of $1,000.

ECUADOR.

Although gold and silver abound in Ecuador, the annual output of both is exceedingly small. Gold is obtained mainly from alluvial deposits, but there are quartz veins in Zaruma which yield from one to four ounces to the ton. At Esmeraldas, an American company, using hydraulic methods, is working deposits which yield about 14 cents to the cubic yard. The Indians procure considerable gold from the numerous auriferous streams. At Pillzhum, in Cañan, rich silver ore is found, but is not worked at present.

The United States minister to Ecuador, Mr. A. J. Sampson, states, in answer to this Bureau's interrogatories, that Ecuador, in 1902, exported gold ore to the value of $200,000. As no gold coinage was executed, and as the industrial consumption of the precious metals is slight in that country, the amount of gold exported is assumed to represent the entire product, which, on the above valuation, would be 9,675 fine ounces, a gain, when compared with the yield of 1901, of 4,354 ounces, or nearly 82 per cent.

In the absence of any data regarding Ecuador's silver production for 1902, it is assumed to have been the same as that of 1901, which this Bureau estimated at 240 fine kilograms, or, approximately, 7,734 ounces, of the United States' coining value of $10,000, and the commercial value, at 53 cents per ounce, of $4,099.

GOLD PRODUCT OF ECUADOR.

Year.	Ounces.	Value.
1899	2,315	$47,855
1900	5,208	107,665
1901	5,319	109,954
1902	9,675	200,000

GOLD MINING IN ECUADOR.

But one mine is being worked in this consular district at present, although there are some other claims as yet undeveloped. The name of the enterprise is the South American Development Company, usually called the "Zaruma." It is located in the district of Zaruma, Province of El Oro. All the work is in tunnels, the lowest and principal tunnel being about 2,300 feet in length, reaching a depth below the surface of 650 feet.

The rock is blue and white quartz, carrying about 10 per cent sulphides of lead, zinc, iron, and copper. Some free gold is found in particles. The ore is andesite. There are also placer mines in the province of Esmeraldas.

ROBERT B. JONES,
Vice-Consul-General.

GUAYAQUIL, *June 30, 1902.*

GOLD MINING AND MILLING IN ECUADOR.

[J. W. MERCER in the Engineering and Mining Journal, New York, August 15, 1903.]

The Zaruma gold mines are situated in the district of Zaruma, province of El Oro, Republic of Ecuador, South America, in latitude 3° 45′ south, in the west Cordilleras of the Andes, at an elevation of 3,000 feet, and about 60 miles southeast of the city of Guayaquil. The mines are reached from Guayaquil by small river steamer to Santa Rosa, and thence by mule 45 miles.

The little village of Zaruma is a Spanish town of 1,000, the buildings being of adobe walls and tile roofs, while the streets are narrow and paved with cobblestones. Indeed, many pieces of "lively" appearing quartz may be seen serving as pavement.

The town was founded in the middle of the sixteenth century by some of the Spaniards who had been engaged in conquering the country. It is at the headwaters of the River Tumbez, which empties into the Pacific at the old town of Tumbez, where Francisco Pizarro and his band of gold seekers landed when they began to conquer and destroy the wonderful Inca. The old stone-paved road built by the Incas to connect the city of Cuzco, in Peru, with Quito, in Ecuador, passes near Zaruma.

The extent of the mineral region is not fully determined. It extends for several miles north and south, and contains numerous gold-bearing veins in andesite. The Spaniards worked the mines from the middle of the sixteenth century to less than one hundred years ago.

The old workings now open are sufficient to prove very extensive operations at one time. It seems that at first they worked the soft and broken veins and surface gravels as placers; later came the arrastra and stone mill. The latter consists of an oblong bowlder containing two sockets which serve as a mortar, while a stone shoe is fitted into a wooden boss and stem. They were worked either by hand or overshot water wheel. Many of these old mortars and shoes may still be seen, partly covered by soil.

I have examined at least 20 old Spanish mines, some of which extend to a depth of more than 100 feet. The Spaniards selected the soft streaks of the veins, and did not mine below the oxidized zone.

The mining system employed was that of small pillars and chambers with inclined steps for entrance and exit. The only metal tool found in the old mines is a hand bar of soft iron. Most of the old workings are now inaccessible.

After the Spaniards a French company operated for a time in the district, and then, in 1878, came an English company, which worked quite extensively with a light-weight stamp mill, but apparently they could not satisfactorily treat the ores, and discontinued operations in 1893.

In 1897 the South American Development Company, of New York, began developing, and is still operating.

In Ecuador a mining claim is 200 by 600 meters, and must pay an annual government tax of about $5 each year in advance. No patent or deed is given, the claim being held by possession and the payment of the tax. The law states that the taxes shall be expended upon the construction of a road between the mines and the coast. Mining supplies are free of import duties, and the output is free of export duties.

The veins make a very interesting study, showing various stages of alteration. In some formations there may be seen clean blue-white quartz, the highly silicified and altered fragments and "horses" of wall rock in the vein, walls of partially mineralized andesite, and the pure andesite country rock a short distance from the vein. Most of the wall rock contains pyrite, while the "horses" are often heavily impregnated with it. The veins are of two types, one with well-defined parting, the other with tight-frozen walls, where it is difficult to determine the line between vein and country. There is one large fault vein with course north and south and dip of about 70° easterly, which may be traced several thousand meters along the surface.

From the northeast many quartz veins come into this, but none have as yet been traced on its westerly side. Most of these latter veins have a course east of north with southeasterly dip. The veins of the district usually range in width from 1 to 6 meters. The ore shoots generally pitch north.

The most common ore is a blue-white quartz containing 10 to 12 per cent of sulphides—galena, pyrite, chalcopyrite, and blende. The values are mostly in gold, which seldom appears visible, but probably occurs as free gold in the quartz and sulphides. Close concentration tests would indicate that about 50 per cent of the gold value in the ore is in the sulphides. Oxidation rapidly occurs when the ore is exposed to the atmosphere. The wall rock usually carries small values.

Three methods of taking out the ore are employed. Where the veins are wide and the walls loose, the stopes are filled from surface. If in such veins surface filling is not possible for lack of raises, pillars are left until connection with surface is made. Where the veins are narrow or the walls firm, the underhand method is employed and the stope left open.

The filling method used is one not very common. First, a raise is begun in the center of the ore body or center of the block of ground to be mined and is put through the surface. At each end of this block a timbered chute is carried up as the ore is taken out. Ore is mined in the form of a pyramid with the surface raise at its summit. After filling, the sides of the pyramid are planked so that the ore next mined will slide by gravity to the chutes at either end. Thus it may be carried on by mining and filling to the surface. Our largest stope opened in this manner is 100 meters in length. Every effort is made to avoid the use of timber, because of the scarcity of the first-class article. That which is most easily available rots in a few years in underground service. Of course, this method requires a lateral working drift which taps the ore body by crosscuts at the end chutes and in the center if desired, thus making it possible to fill the entire space made by the vein.

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BRAZIL.

Mr. L. C. Irvine, vice and deputy consul-general of the United States at Rio de Janeiro, states in reply to this Bureau's interrogatories that the gold product of Brazil for the first six months of the calendar year 1902 amounted to 2,024.351 kilograms, adding that the State of Minas Geraes, which is the chief gold-producing State of Brazil, exported during the year 1902 gold to the amount of 3,854.103 kilograms. During the first six months of the year Minas produced 1,949.755 kilograms and during the second six months 1,904.348 kilograms. There was therefore a slight falling off.

The next State in importance is Bahia. Its output is, however, far inferior to that of Minas. There are, no doubt, many places in Brazil where gold can be found, but exploration and development are needed. Such a large part of Brazil's surface is covered by a heavy tropical growth that prospecting must necessarily be slower than in many other gold-producing countries, where conditions are more favorable to the searcher. I am told some gold is produced in the district recently awarded to Brazil in the arbitration with French Guiana. This gold is sent up through the Guianas, and I am unable to form any idea of the amount. Of course a good deal of gold is exported clandestinely to avoid the export tax levied by the various States. Practically the whole of the export of gold produced by Brazilian mines is to Great Britain.

On the basis of the above figures this Bureau estimates that the product for the entire country for the year 1902 was 4,001.557 kilograms, assumed, as in former years, to have been 0.750 fine, which is equivalent to 3,001.168 kilograms, or 96,488 fine ounces, of the value of $1,994,576, a loss as compared with the yield of the preceding year of 37,772 ounces, or 28+ per cent.

No silver mining is carried on in Brazil at present, the low price of the metal and the cost of transportation and labor making it unprofitable.

THE GOLD FIELDS OF CALCOENE, BRAZIL.

[MAURICE CLERÉ in the Engineering and Mining Journal, February 28, 1903.]

These gold fields are situated near the headwaters of the Cassipore River, in the territory formerly claimed both by Brazil and French Guiana, but now belonging definitely to Brazil, and forming a part of the province of Sara. The gold region lies about 70 miles in the interior, and communication with the coast is made by a single rail mule tramway of special design and belonging to a French company, which also owns a license to mine over the best parts of the territory.

The gold-bearing region extends over a territory of about 150 square kilometers, but it is very likely that some other areas, more or less auriferous, will yet be discovered. The first activity in Calcoene occurred in 1893–94. Over 6,000 men came and built their palm cabins and started work along the streams. They were nearly all negroes from the Guianas, with a few Portuguese, Brazilians, and Americans. The period of large output lasted about four years, but it fell off suddenly. The population lessened by degrees, and nowadays only 50 to 70 negroes remain there, working in small parties of 4 or 5.

Geology.—The geology of the gold-bearing region is little known. As is often the case in tropical countries, the country rock is decomposed to a great depth by reason of weathering. Granites and quartzites abound. Diorite is also reported to exist.

In the decomposed rock at the surface there are numerous bowlders of hematite and small deposits of pyrolusite (manganese oxide). Big dikes of pegmatite are often found along the beds of the gold-bearing streams.

Occurrence of the gold.—The deposits are shallow placers of recent formation. They are limited to the actual beds of the streams, no bench gravel having ever been found. The gold-bearing ground appears to be limited to the heads of the several creeks which unite to form the Cassipore River; as they are confined to deep valleys between the hills they are narrow and the gravel is very limited in extent, except in certain places downstream, where are found large swamps, not so rich as the upper parts, but covering a wide area.

Most of the creeks have been worked over a good many times since 1893. They have paid well, but the occurrence of gold has been pockety.

The characteristics of the deposits are as follows: One or 2 yards of barren clay covering from 1 to 2 feet of pay gravel, lying on the bed rock. The pay dirt consists mainly of a medium-sized gravel; the bowlders are sharp, little rolled, and nearly all of white quartz, with some pegamite. The maximum size is not over 7 inches.

The quantity of rolled quartz in the gravel is remarkable.

The bed rock usually is a soft clay, probably a decomposed eruptive rock.

The gold of the Calcoene district is minute, often scarcely rolled. Flour gold is abundant. Nuggets have been rare and always very small. The gold is of the brightest yellow and of high fineness. Quicksilver is employed to catch it.

Actual mining.—Some gold is still obtained from the creeks by the ordinary Guianese method. Though the streams have probably been worked three or four times, they still yield an average of 40 to 60 cents per cubic yard. This arises partly from the fact that much gold was lost in the early days on account of the daily fighting over the water supply. Other reasons for a heavy loss of gold are evident in the shortness of the sluices (consisting of only three or four boxes), the clay which is mixed with the dirt so as to retain the fine gold, and, finally, the hurrying of the sluicing in order to get ahead and start upon new and rich ground. Working so carelessly, the miners left untouched many small patches of virgin ground which negroes to-day are looking for eagerly.

Quartz veins.—The lodes which were the source of the alluvial gold have not been found. There is no doubt that this gold comes from quartz ledges, the remains of which are found in the shape of quartz bowlders all over the country; but it seems that these ledges, very limited in depth, have been entirely destroyed by weathering, and washed out.

By tunneling into the hills quartz ledges have been encountered under the thick cap of surface dirt. These veins contain little free gold, but they carry sulphides and, rarely, tellurides. Under the bed of Coolie Creek there has been found between the pay gravel and a chloritic clay a layer of broken fragments of quartz, sharp edged and averaging 3 ounces of free gold per ton. A search is being made for the source of this layer of good ore.

Alluvial flats.—Swamps are numerous in this region, especially in the lower valleys. Some of them have been worked by the negroes, but not thoroughly because of the very slight gradient, the depth to bed rock, and the obstacle presented by a sticky clay. The best known of these flats are Grande Crique, Regina Creek, Clement Temba Creek, Lorenz Creek, and the Grand Placer. These areas can be reckoned upon as yielding 20 to 40 cents per cubic yard, including the upper cap. Many flats are as yet untouched, especially those in the vicinity of the old Portuguese placer.

All those deposits could probably be worked by means of dredges. There are in this region, the writer believes, several million cubic yards of an average value of about 30 cents. The greatest depth to bed rock is 4 yards; the bed rock is almost always soft and can be readily scraped out by the buckets. Bowlders are small and easily handled. There are plenty of stumps, big roots, and fallen trees in the gravel and upper clay, but the modern dredges are built to deal with them. Water power is not absolutely at hand, but it is to be obtained within 20 miles. Although the country is covered by a dense forest, most of the timber burns with difficulty, so that steam dredges would not prove as economical as those operated by electricity. The writer considers that in Calcoene dredges of small capacity are to be preferred to larger ones, as there are many flats of limited area.

It seems best to design a bucket dredge, capable of handling 200 to 300 cubic yards per day of twelve hours, and that can be taken down easily and moved farther on. A few creeks, as Regina and Grande Crique, because of their large workable area, would well admit a dredge of much larger capacity. In any case it has to be borne in mind that the expense of clearing away the timber will be large.

PERU, BOLIVIA, AND CHILE.

Owing to the inadequacy of the data regarding the production of the precious metals in Peru, Bolivia, and Chile, it is necessary to have recourse to statements of exports, but as the product of one country may be exported from the seaport of another it is impossible to determine in every case exactly where the metal was mined. This Bureau endeavors to ascribe the exports to the country of origin, at the same time admitting that it is not always possible to do so.

PERU.

This Bureau is indebted to Mr. Irving B. Dudley, United States minister to Peru, for an exceedingly comprehensive response to its interrogatories for 1902, in which it is stated:

> There is no means of knowing what amount of gold the mines of Peru produced, and it is only possible to report what amount passed out through its custom-house to foreign countries, as well as to Callao, which is the only port that has received gold.

The following are the details of this movement:

	Soles.
Ores shipped from Molendo	594, 695. 00
Molendo to Callao	533, 203. 37
In bars and ingots—	
Quilca to Callao	40, 627. 30
Salaurry to Callao	6, 862. 80
Total	1, 175, 388. 47

The national mint received 806.467 kilograms of crude gold, which yielded 719.416 kilograms of fine gold, worth 982,494.25 soles. These two items would amount to 2,157,883, soles or $1,050,889, equivalent, approximately, to 1,581 kilograms. The following article, which is taken from the minister's report, indicates that the gold production of Peru is much greater than that amount:

PRODUCTION OF GOLD IN PERU IN 1902.

> In the absence of statistics of our mineral production, and on account of the difficulties mentioned on various occasions, it is impossible to know with accuracy the annual output of gold in Peru, and we can only estimate approximately the production, rather putting it down at a lower than at a higher figure.
>
> Consequently, starting from information obtained from various sources, and which we have examined minutely, in view of the carefully estimated increase in the revenues of the localities set forth in our statistics for 1897, and also in the output of the

Santo Domingo mines, which in 1901 amounted to 1,100 kilograms of gold, pure metal; in view of the figures which we have put down to the new exploitations, now that the gold-mining industry is every day acquiring greater importance, as is proved by the constantly increasing demand for gold-producing properties and also by the numerous assays for gold made during the past year at the school of engineers, besides those effected at the mint and other special offices; putting down at a minimum the amount produced by the mines at Andaray and by those of the Quebrada de Quinoa, and finally taking into consideration the gold extracted from the various articles taken out of the "huacas," or burial grounds of the prehistoric races in Peru, we arrive at the sum of 3,463 kilograms 353 grams, net weight of the gold produced in Peru in 1902, the details of which are given in the following table:

PRODUCTION OF GOLD, 1902.

Source.	Gross weight.	Fine weight.
	Kilograms.	*Kilograms.*
Output of the localities mentioned in our statistics for 1897 (1,000 kilograms fine gold with an additional 50 per cent for 1902, and the Poto deposits being put down at only 276 kilograms)	....	1,500.000
Output of the new exploitations in the departments of Ayacucho, Apurimac (province of Cotabamba), Puno, and Cuzco (Marcapata deposits)	200.000	....
Santo Domingo mines (Carabaya, department of Puno), production in 1901, 1,100 kilograms fine gold, with 30 per cent additional	....	1,430.000
Andaray mines (department of Arequipa), monthly output 100 ounces, or 1,200 yearly, equal to	34.440	....
Quebrada de Quinoa (Cerrode Pasco districts), monthly production 1,000 ounces, or 12,000 yearly, equal to	344.400	....
Gold extracted from articles taken from the "huacas"	3.000	
Total	581.840	....
Fine gold contained in 581 kilograms 840 grams, at an average fineness of 22 carats	....	2,930.000 533.353
Total	....	3,463.353

The accountant of the Lima mint, Mr. Luis Lembcke, in the pamphlet which he has published regarding the operations of that establishment during 1902, states that the weight of the ingots of gold received in the mint for coinage into Peruvian gold pounds (a coin equal in every respect to the pound sterling) amounted to 719 kilograms 416 grams 176 milligrams of fine gold, and as these figures represent, more or less, the twenty seventy-sixths per cent of the amount of our calculations, we do not consider that there is any exaggeration whatever in putting down the total production of gold in Peru during 1902 as 3,500 kilograms of fine gold, in round numbers.

We have thought it necessary to include in the above table an item corresponding to the gold found in the subterranean burying places of the ancient Peruvians, because the quantity of the precious metal which they represent is not to be despised. With reference to this matter, we may observe that a large number of those articles belonging to the Incaic period, instead of coming to Lima to be exhibited in the jewelers' shops, are purchased at high prices for shipment to Europe, as occurred only last year with the different articles extracted by the Messrs. Elias from the "huacas," in the province of Ica; and we may also mention, among similar cases, that in the years 1870 to 1872 the antiquary, Señor N. A. Saenz, paid no less than 2,000 soles ($1,000) gold for gold and silver objects of subterranean origin discovered in one of the excavations made in the cemetery of Ancou.

T. OLACCHEA.

The gold production of Peru for 1902 is accordingly placed at 3,500 kilograms, of the value of $2,326,100, equivalent to 112,525 fine ounces.

It is stated that Peru, in 1902, exported silver ore to the value of 3,467,473 soles, and that ore to the value of 1,173,627 soles was refined in the Lima mint. Assuming these amounts to represent her entire output for that year, it would amount to 4,641,100 soles or $2,260,216, which would represent 4,264,558 fine ounces.

It is stated that the exports of silver amounted to 4,956,248 soles, which is 315,148 soles in excess of the amount reported as produced, but this excess is composed of exports of old silver and coin.

BOLIVIA.

It is said that gold exists in considerable quantities in Bolivia in alluvial gravel, especially in the eastern valleys of the Cordillera Real, in the upper branches of the La Paz River, and in the valleys radiating from Mount Sorata. It is washed out by the Indians in small quantities. Veins of auriferous quartz are being profitably worked in the Araca Mountain, opposite Illimani. The yield, however, is inconsiderable at present.

According to Mines and Quaries for 1901, Bolivia exported gold to the value of 12,795 pesos through the Chilean port of Antofagasta in that year. This figure is from official returns furnished by the Sociedad de Fomento Fabril, Santiago, and Estadística Comercial de la Republica de Chile, 1900 and 1901, Valparaiso. The total silver exports, according to the same authority, were:

	Pesos.
Silver ingots	354, 228
Silver ore	19, 924, 112
Silver sulphides	826, 443
Total	21, 104, 783

Additional exports containing silver were as follows:

	Pesos.
Silver lead	365, 457
Silver-lead ore	9, 741
Silver and copper ore	4, 948
Silver and copper matte	126, 000
Total	506, 146

Assuming that 50 per cent of the last total is represented by the base metals, the silver contained in it would be worth 253,073 pesos, making a total export of silver for 1901 of 21,357,856 pesos, equivalent, at 36.5 cents to the peso, to $7,795,617, which, at 60 cents per ounce, the average price during 1901, would represent 12,992,695 fine ounces of silver as the yield of 1901. This estimate exceeds that of Mineral Industry, which is quoted by Statistique de l'Industrie Minérale, for 1901, by approximately 3,663,000 fine ounces, and also that of this Bureau, published in the report for 1901, by 2,738,000 fine ounces. In the absence of any data for 1902, the estimate, 12,992,695 ounces, is repeated for that year. The gold yield therefore is placed at 12,795 pesos, equivalent to $4,670, or 226 fine ounces, and the silver at 12, 992,695 fine ounces, of the commercial value—at 53 cents per ounce, the average price during 1902—of $6,886,128.

[From Consular Reports, March 19, 1903.]

MINING ENTERPRISES AND LIMITED COMPANIES OF BOLIVIA.

Minister Sorsby transmits from La Paz translation of a recent decree of the Bolivian Government relating to limited companies and mining enterprises doing business in Bolivia, which reads:

ARTICLE 1. Limited companies and mining enterprises, be their owners private persons or associations of either denomination or class, are obliged to keep books, as indicated in article 32 of the mercantile code, and also a register of the fineness of the metals they export.

ART. 2. The associations and enterprises designated in the foregoing article shall draw up their respective balance sheets and shall send two copies to the Minister of Finance and Industry or to the office of fiscal inspection within the forty days following the termination of the year, without omitting the publication and remittance to be effected by said associations in accordance with the supreme decree of March 25, 1887.

ART. 3. Within the same period of forty days the payment of the fiscal tax of 2 per cent of the net profits must be made in the respective departmental treasury, in favor of the national treasury.

ART. 4. For the purposes of the foregoing article, net profits shall be understood to be the sum set apart for the payment of dividends—or rather the gains of the partners or owners, whether they reside within the Republic or abroad.

ART. 5. The dispositions contained in articles 3 and 4 of the decree of March 25, 1887, are applicable to mining enterprises, whether they be owned by private persons or associations.

ART. 6. The administrators of departmental treasuries are obliged, on their own responsibility, to give notice to the ministry of finance of such associations or enterprises as have not paid the fiscal tax within the period stated in article 3 of this decree.

ART. 7. A term of sixty days from the date of the publication of this decree is allowed for the mining enterprises and limited companies to be inscribed in the registers opened in the prefectures of the departments, in accordance with the aforementioned article 3 of the decree of March 25, 1887.

ART. 8. Any failure to comply with the dispositions contained in articles 1 and 2 of this decree will be punished with a fine of 500 to 1,000 bolivars ($180.50 to $361) imposed by the prefects of the respective departments, or the inspector named by the Government, on the guilty enterprises or associations; and, furthermore, their profits shall be calculated by special commissioners at the expense of the association or enterprise.

ART. 9. The same fine will be imposed on all enterprises or associations that fail to comply with the provisions of article 7.

ARTICLE 32 OF THE MERCANTILE CODE.

Every merchant shall, without fail, keep four mercantile books, (1) journal, (2) ledger or current accounts, (3) book of inventories, and (4) copy book.

ARTICLES 3, 4, AND 9 OF THE DECREE OF MARCH 25, 1887.

ART. 3. The registers that the prefects must cause to be formed in each capital or department, up to July 31, next, shall contain the title of the company, its object, its nominal and effective capital, and the name of the manager or administrator responsible for the payment of the tax. A copy of these data shall be sent to the administrator of the respective departmental treasury and to the minister of industry.

ART. 4. In the same register shall be inscribed the companies organized thereafter.

ART. 9. The general balances and the lists of shareholders shall be published annually in the report of the directors or of the representative within ninety days from the termination of the year.

FREE EXPORTATION OF SILVER ORES AND BULLION.

[From Monthly Bulletin of the International Bureau of the American Republics, November, 1902.]

President Pando has sent a message to the Chamber of Deputies recommending the passage of the following law authorizing the free exportation of silver ores and bullion on and after January 1, 1903:

ARTICLE 1. The exportation of silver ores and bullion produced in the territory of the Republic is hereby declared free of duty.

ART. 2. It is the duty of every exporter of silver bullion and ores to secure from the national custom-house a waybill showing the weight of the ores and bullion and their grades and destination. For each mark of silver that the ores or bullion contain 10 cents shall be credited as a statistical tax.

ART. 3. The failure to obtain the exportation waybill referred to in the foregoing article will work a confiscation of the shipment, one-half of which shall go to the informer.

ART. 4. Mining enterprises, whether made up of private individuals or associations of whatever nature, shall pay 6 per cent of their net profits to the Government, based on their semiyearly balances, an account of which shall be rendered. The tax of 2 per cent on enterprises that exploit other classes of mines, according to the law of November 12, 1894, remains in force.

ART. 5. For the purposes of this tax the balance that remains after deducting the necessary expenses of exploitation, treatment, administration, and transportation charges shall be considered as the net gain.

ART. 6. The mining tax, which is collected at the present time on every concession, in accordance with article 16 of the mining law of 1880 and that of November 11, 1897, is hereby fixed at 6 bolivianos ($2.29) for the veins, lodes, and shafts referred to in paragraph 2 of said article 16; 3 bolivianos ($1.15) for earths and substances enumerated in article 12 of said law, and 50 cents (silver) for those specified in article 13. This shall be considered as a federal tax.

ART. 7. This law shall become operative on and after January 1, 1903. The Executive is authorized to duly enforce the same.

CHILE.

No official figures regarding the production of the precious metals in Chile during the year 1902 have reached this Bureau; final figures for the preceding year are, however, now at hand.

Chile publishes very full statistics of her exports of the precious metals, carefully distinguishing between those of domestic and foreign origin, as the Bolivian product is exported through the Chilean port of Antofagasta. The publication containing these figures, "Estadística Comercial de la República de Chile," is, however, generally a year late. According to the issue covering the year, 1901 the Chilean exports of the precious metals during that year were as follows, the value being given in pesos; it should be noted that these exports are described as domestic (nacionales), and are distinguished from those of Bolivian origin:

	Pesos.
Silver	5,006,877
Silver, copper, and lead	1,584,252
Silver and gold	42,710
Gold	1,507,452
Gold and copper	8,422
Gold, silver, and copper	128,961

This Bureau, after allowing for the base metals, estimates the value of the gold in the above exports at 1,576,005 pesos, worth, in United States money—taking the peso at 36.5 cents—$575,242, equivalent to 27,827 fine ounces; and the silver at 5,863,345 pesos, or $2,140,120, representing, at 60 cents per ounce, 3,566,868 fine ounces.

In the absence of any figures for 1902, those for 1901 are repeated, the commercial value of the silver being reduced to $1,890,440, owing to the fall in the average price from 60 cents to 53 cents.

These final figures for 1901 necessitated a correction in the figures hitherto published by this Bureau for that year—for Peru, Bolivia, and Chile—which were: Gold 121,712 fine ounces, silver 25,110,238 fine ounces, but which now stand 92,353 and 22,160,411 fine ounces, repectively, for gold and silver.

The total product of these countries for 1902 is estimated by this Bureau at 140,578 fine ounces for gold and 20,824,121 for silver.

SILVER AND GOLD IN CHILE.

[From United States Consular Report, February 6, 1903.]

The Government of Chile has no statistics on mines and mining, notwithstanding the fact that the country possesses varied mineral resources, including gold and silver. For this reason it is difficult to procure reliable detailed information, as all data must be obtained through private sources.

Capiapo.—In this district, the most northerly territory under the Valparaiso consular jurisdiction, the gold and silver being mined at this time is practically nil. The famous silver mines of Chañarcillo and Chimbote, which once yielded millions of dollars, are located in this district, but they have so nearly given out that their production, workings, etc., are no longer reported.

Of gold mines, there are some few lodes in the district above mentioned, but they have never been worked to any considerable extent, and there is no record of their production. Preparations are now being made by an English company to reopen an old gold mine near Copiapo, called "Jesus Maria," from which fair results are anticipated.

Coquimbo.—I am informed through the intendente of the Coquimbo district that no statistics are kept of the production or working of mines in that territory. There are in the district 1,883 mines which paid working license for the year 1902. The claims are for a total surface right of 12,345 acres of land, for which the sum of $32,400 in Chilean currency was paid. These mines include silver, 154; silver and gold, 1; silver and copper, 47; gold, 165; copper and gold, 33; silver and lead, 6; copper, silver, and gold, 1.

Talcahuano.—There are no detailed statistics available concerning mines or mining in this district. No silver is mined, and the production of gold for the entire district was estimated at $10,000 last year. The gold is mined in a small way, there being no large companies operating in that part of the country.

Punta Arenas.—Moritz Braun, United States consular agent at Punta Arenas, reports that there are no silver mines in southern Chile and no gold of any importance. The only mining is for gold, and the claims worked by small squads of men and individuals are so numerous and scattered over so great an extent of territory—through most of which there are no roads—that it is impossible to secure a list of the claims. They are situated principally in the large island of Terra del Fuego and upon smaller islands in the vicinity of Cape Horn; also on the Patagonian coast line between Cape Dungeness and the Gallegos River.

The soils where the claims are situated are, generally speaking, alluvial, and the method employed in working the mines is very simple, consisting of primitive washing apparatus. The depth where the yellow metal is found is from ten to fifteen feet below the surface.

Owing to the manner in which the gold is mined, it is practically impossible to collect exact statistics as to the output. It is estimated that the production of gold in this territory for the year 1901 was 100 kilograms (220.4 pounds) and the number of men engaged in gold mining approximately 500.

Gold is not taken from quartz in this district. At various times attempts have been made to produce gold by more elaborate methods than those now in vogue, but they have all ended in failure. Gold mining in this section seems only to pay in a small way and is engaged in by the poor working classes—Austrians, Italians, and Chileans—who are willing to lead a lonely, rough life in a climate that is exceptionally severe. The average amount earned per month by those engaged in mining in this section of Chile would not exceed $50 in United States currency.

R. E. Mansfield, *Consul.*

Valparaiso, *November 1, 1902.*

ANTOFAGASTA.

The following statement was given to me by Mr. Edward Jackson, M. E.:

The only two silver districts of importance in this department are Caracoles and Inca Caracoles.

Caracoles.—This district lies 110 miles from the coast due east of the port of Antofagasta. It was discovered in the year 1869, and owing to the number and richness of the lodes, the population reached 20,000 in 1876. To-day this has been reduced to 500. Communication is effected with the port of Antofagasta by a good cart road, 24 miles in length, to the station Sierra Gorda, on the railway, which is itself 105 miles from the port. The country rock is limestone, gray and black, of the Jurassic formation, which is here and there broken up by porphyry. The lodes have calcspar, gypsum, and baryta for a gangue or matrix, and the ores are chiefly chlorides, chlorobromides, iodides, and mixtures of chlorides and sulphides. The production of Caracoles has been estimated at 60,000,000 ounces fine silver. At present the production is very reduced, not exceeding 7,000 ounces per month. There are several shafts, ranging from 300 feet to 600 feet in depth, and there is one—the Deseada shaft—2,500 feet deep. The ore deposits are nearly all superficial, some zones only reaching a depth of 600 feet, where the ore is very poor. The ore is generally found in pockets or in chutes of limited sizes. Deep mining has been abandoned for several years, as the Deseada shaft and others have proved that the veins split up into small fissures. There are several mines still which require more careful study. Any small pocket can repay years of exploratory work.

Inca Caracoles.—This mineral district was discovered soon after Caracoles. It lies 20 miles north of Calama, with which town it is connected by a good cart road, which makes a circuit 40 miles in length. Calama is 150 miles from the port by rail. The country rock is porphyry, gangue, chiefly decomposed baryta and peroxide of iron. The lodes are formidable, ranging from 3 to 6 feet in width. The ore is chiefly chloride, finely disseminated in all the lode and averaging 40 ounces to the ton. From 1872–1883, the ores were treated at an establishment on the River Loa, at Chacance, 45 miles distant, but since this was washed away by a flood very little work has been done, owing to the absence of water and heavy freights. Once a pipe is laid down to provide this mineral district with water, this will be one of the most productive silver centers in the world, as there are an immense number of lodes and all contain 30 to 40 ounces of silver to the ton. The ore is splendidly adapted for lixiviation with hyposulphite, and does not require roasting. At present, the price of water is $4 gold a ton. The same piping which is to serve the copper district of Chuquicamata could be prolonged to the Inca. This would cover a distance of 45 miles from the river to Chuquicamata and 16 miles more to the Inca, or 61 miles in all. The principal mines are the Irene (300 feet deep), the Santo Domingo, Arturo Prat, Marquina, Blanca, and Descubridora.

GOLD.

There is only one district of importance which produces this precious metal.

San Cristobal.—This district lies 42 miles southeast of the station Cuevitas, on the Autofagasta Railway, which is itself 50 miles from the port. There is a good cart road to Cuevitas. The mines were discovered in 1882, and have been worked ever since slowly and with great difficulty, owing to the lack of water. This has to be taken up from the railway and costs about $4 gold a ton. The country rock is rhyolite and the lodes are quartz. The gold is found in its native state with little or no pyrites, but there is a good deal of carbonate of lead and silicates of copper. The principal mines are the Bolaco, Palmira, Pobre Diablo, Bolaquito, etc. The deepest is the first named—300 feet. The Palmira has a tunnel 600 feet in length along a 3-foot lode, which averages 1 ounce to the ton. The Bólaco has given very rich ore in a vien of 2 to 3 inches thickness which accompanies the lode. The production, which for a long time was between 500 and 700 ounces per month, is now only about 100 ounces.

With a water supply, this district would have a large production.

Charles C. Greene, *Consul.*

Antofagasta, *November 12, 1902.*

IQUIQUE.

SILVER.

The names of silver mines in the mineral section of Huantayaja, province of Tarapaca, are: San Agustin, San Pedro y San Pablo, Discubradora, San Juan, Hilguera, Maria, San Bartalo, Pique del Llano, Colorado, Alliance, and Fortuna. The depth of workings of these mines varies from 200 to 1,300 feet, though there is a shaft in the San Agustin mine to a depth of 2,000 feet. The last 700 feet is through solid rock.

The annual production for the last ten years is stated at about $400,000. During the seven years preceding 1892 it is estimated that $15,000,000 worth of silver was taken from this district. The total amount that has been taken from this group of mines is said to be $22,000,000.

The general character of the ores is chlorides. The formation of the rock is porphyritic and calcareous. The very rich ores and white silver (about 95 per cent pure) are usually found in "pockets," near the contact of the calcareous porphyritic rocks.

In the mineral section of Santa Rosa, a short distance from the above-mentioned mines, are the following silver mines: Pique Gallo, Consequencia, Paniso, El Grande, and others of less importance. These mines range in depth from 200 to 900 feet. I have not been able to get any reliable information as to the silver taken from this group. During the last ten years the Paniso mine has produced about $1,600,000.

GOLD.

Gold has been found, in a granite formation, at a depth of about 200 feet near the minor port of Junin. As yet only a few samples have been taken from the mine.

C. S. Winans, *Consul.*

Iquique, *July 24, 1902.*

ARGENTINA.

It is generally believed that the mineral resources of Argentina are great, but thus far the lack of means of internal communication has prevented their development. As railways are extended to the Andes, the mining industry, doubtless, will rapidly expand.

Definite information regarding the production of the precious metals in the Republic has hitherto been lacking, and such figures as this Bureau has been able to offer have been based chiefly on statements of exports of ore and metal and on the remarks of various observers.

Under date of April 13, 1903, Mr. Edward Winslow Ames, United States chargé d'affaires ad interim, at Buenos Ayres, writes that there are no statistics obtainable of the gold and silver production of the country, but that the value of the yield of the former metal would not exceed $50,000. As no coinage is executed in the country, and as the amount of the precious metals used in the industrial arts is small, the exports are held to represent approximately the entire output. The customs statements show that in 1902 there was exported copper and silver matte to the value of $29,300; copper, silver, and gold matte, $32,750; silver and gold bars, $2,250, and silver bars to the amount of $3,000.

According to the annual statement of the Trade Returns of the United Kingdom for 1902 Great Britain imported from Argentina gold bullion to the amount of 591 standard, or 542 fine ounces; silver bullion, 19,024 standard, or 17,597 fine ounces, and silver ore to the value of £2,348, or $11,423, equivalent, at 53 cents per ounce, to 21,553 fine ounces.

From the above meager data this Bureau estimates the gold production of Argentina at $30,000, equivalent, approximately, to 1,451 fine ounces, and the silver output at $20,000, equal to 37,700 ounces.

[From report of Mr. James M. Ayers, United States consul at Rosario, Argentina.]

There are located in the different districts of the province of Catamarca 43 mines, of which there are 4 yielding gold, 6 silver, 6 gold with silver and copper, 1 gold with silver, 1 silver with lead, 2 silver with copper, and 1 bismuth with silver.

Each of these is owned and worked by private owners under governmental supervision, but they do not pay these owners, who simply work them to keep alive the concession under which they are held, in the hope that some day means may be found of transporting the product to a market at a less cost than is now possible with the primitive and expensive methods available.

Besides these smaller mines, there is a series of mines in the district of Andalgala, formerly the property of Lafone & Quevedo, which, having been thoroughly examined by the agents of a syndicate of English capitalists, have been purchased, and the managers are proceeding systematically, by modern processes and with capital, to their development. The name of the company is the Capillitis Copper Company (Limited). In the mines they have secured there seems to be an unlimited supply of copper, with by-products, such as lead, silver, and possibly some gold.

From a recent report of Prof. H. D. Hoskold, director-general of the department of mines and geology of this Government, I learn that in this district are found, besides other mineral products, the following:

Mineral.	Province.
Gold (native)	Catamarca, Salta, and Jujuy.
Silver:	
Native	Catamarca and Salta.
Sulphide	Catamarca.
Sulphuret	Catamarca, Salta, and Jujuy.

LEGATION OF THE UNITED STATES OF AMERICA,
Buenos Ayres, May 16, 1903.

DEAR SIR: I inclose herewith a copy of a letter, recently received from Mr. H. D. Hoskold, chief of the division of mines and geology in the department of agriculture, which may interest you and which will also explain the unsatisfactory nature of my replies to questions 13 and 15 of your circular regarding mineral output, coinage, etc.

I am, sir, respectfully, yours,

EDWARD WINSLOW AMES,
Chargé d'Affaires ad Interim.

Hon. GEORGE E. ROBERTS,
Director of the Mint, Treasury Department,
Washington, D. C.

CALLE CHARCAS 1240,
Buenos Ayres, May 5, 1903.

DEAR SIR: On various occasions we have issued circulars of inquiries to all parts of this Republic with a view of procuring the mineral statistics from the mining provinces, and the few replies sometimes received were so unsatisfactory and misleading that we were induced to discontinue the practice. The fact is that the authorities in the mining provinces never attended to this important affair, and the mining proprietors, for reasons of their own, did not afford the requisite data. The mining produce of the country is consequently unknown. It is, however, true that various inexpert persons profess to possess the mineral statistics; but what information they obtain upon this subject does not represent the truth, and to publish such data does the Republic more harm than good, because it represents to the world that mining and its produce is an insignificant thing, inducing the belief that rich mines do not exist in this country, and for these reasons we have not been able to comply with the desires of any of the foreign legations.

We are aware, however, that nearly all the gold extracted from the various districts is taken to Chile and passes into private hands, but no account of it reaches us. The same remark applies to various other classes of mineral.

The National Government has no official control over minerals exported, because there is no duty.

I am exceedingly sorry that I find myself unable to comply with your desire, but you will perceive that we have no means of doing so, and, with best respects,

I remain yours, very truly,

H. D. HOSKOLD.

ED. W. AMES, Esq.,
Secretary of the Legation of the United States of America.

MINERALOGY.

[From the Argentine Year Book, 1902.]

The elevated regions of the Cordillera of the Andes, as also the various parallel chains of mountains with the numerous and complicated topographical ramifications which exist in the Andine provinces, from the limits commencing at the southern extremity of Bolivia to the south of Mendoza, as also in the national Territories of Neuquen, Rio Negro, Chubut, Santa Cruz, and Tierra del Fuego, to the extreme south of the Republic, i. e., Cape Horn, are known to contain economic minerals in lesser or greater abundance, as is also the case in the more central provinces of San Luis, Córdoba, and Tucumán, and the other national Territories of Misiones, Pampa Central, and the Andes.

From very remote times mining operations have been carried on in the various localities and districts in the provinces named, and it is notorious that during the epoch of the domination of the Incas and Aztecs large quantities of gold and silver, as also copper and other economic minerals, were obtained from various mining regions, all of which is easy to prove from the extensive subterraneous works which still exist in many places; but it is remarkable that up to the present it has not been possible to discover the mines from which the enormous quantities of gold known to have been possessed were obtained, although there are not wanting traditions referring to the localities in which such mines are hidden. So much so is this the case that it would not be difficult to write an entire volume upon the lost or hidden gold mines which are believed to exist in various parts of the Republic. It would be difficult if not impossible to fix the epoch in which those mining operations were first initiated in South America and, in particular, in the Argentine Republic; but the special class of ancient pottery remains which still exist demonstrate beyond all doubt a very remote antiquity. We must therefore presume that mining was much advanced during that period of civilization, which period may be denominated the first epoch of the mining industry. For every practical object we may consider with all truth that the second mining epoch commenced with the Spanish conquest, as the works executed by Pizarro in the silver mines of Poreo and Potosi clearly show. The Spanish continued to work the mines, and so extensive were their operations and so large the benefits derived therefrom that the then King of Spain found it necessary to introduce the "Ordenanzas de Mexico," which remained in force for two hundred years. After the independence of the Argentine Republic the mines were more or less neglected, work being carried on at intervals only, when the internal peace conditions of the country permitted.

According to the national constitution, the provincial governments possess the mines within their respective Provinces, but the mines in the national Territories belong to the National Government. The mining Provinces are those of Mendoza, San Juan, La Rioja, Catamarca, Jujuy, Salta, and Tucumán, extending to the northern portion of the Republic. Those of Córdoba and San Luis are central Provinces. Except in Tucumán, there exists in all the other Provinces named a large number of mining concessions granted from time to time and possessed by different individuals and companies, but many of such concessions are subject to become abandoned and to change of proprietorship, the explanation being that these concessions of mines are not always obtained with the object of a formal exploitation, but for the purpose of speculation.

The principal economic mineral veins found in the mines in various districts consist of gold, silver, galena, argentiferous lead, iron, bismuth, marble, and, in some few, coal and lignite. The same classes of minerals also exist in the national Territories, with the addition of coal, lignite, borate of lime, salt, and various other minerals of commercial value suitable for edifices, pavements, and works of art. Many of the mineral veins in the mines of the various districts of the Provinces contain a certain percentage of gold and silver, and some of these mines have been worked for a considerable time with good results. One of the principal companies which have worked mines of this class in the mountains of Capillitas, Province of Catamarca, is represented by Mr. Samuel Lafone Quevedo, who has conducted mining and metallurgical operations in this district for at least thirty-five years. The mineral from the mines is transported to the company's works at Pilcean, in the same Province, which are the largest in the Republic. The gold, silver, and copper contained in the mineral is reduced in a concentrated form to matte and copper bottoms, and a high price per ton is thus obtained for it in the English market. Arrangements have recently been made by a London company to take over the mines and establishment from the present company. Various other mines in this Province have been opened up from time to time, but nearly all those to the west of the mountains running parallel and to the east of the Andes chain are almost virgin, in fact no proper exploitation has as yet been attempted.

The Province of La Rioja, to the south of Catamarca, has always been considered to be one of the principal mineral-producing Provinces, and contains that famous chain of mountains called Famatina, in which numerous mineral veins as those previously described are to be found. Some of the districts are known for the large amount of native and other classes of silver produced, as also copper containing gold and silver. Various companies have engaged in mining in this Province at different periods.

The National Government is about to enter into a contract for a wire or aerial tramway for the transport of the mineral from the mines to the branch railway at Chilecito, and it is believed that this will give a great impulse to the mining industry. The next Province southward is that of San Juan, in which several mining concessions have been granted but few exploited, the principal reason being the want of cheap and facile means of transport. One gold mine is worked by a French engineer who employs the cyanide process and has obtained good results, whilst some rich copper mines are worked high up in the mountains and the produce taken to Chile.

The Province of Mendoza runs southward from San Juan, and is also notable for the mines it contains, many of which have been exploited from time to time. This Province contains petroleum and coal, but owing to the want of cheap transport neither is worked. The coal is of an excellent quality, the ash containing a large percentage of vanadic acid. The northern Provinces of Jujuy and Salta contain a large number of mines of copper, gold and silver, and auriferous quartz, and the last named also contain lignite and borate of lime. The celebrated mines of San Antonio de los Cobres are in this Province. A London company was formed to exploit these mines, but for want of sufficient capital operations were discontinued. The mineral consists of copper of high percentage containing silver.

In the Province of Tucumán there is evidence of ancient workings of gold and silver mines which in recent times have received no attention. The mines of San Luis have also been exploited by foreign companies, but here also the cost of transport was too high, difficult, and uncertain to leave sufficient profit to permit of mining operations. * * *

The national Territory of Neuquen contains extensive auriferous deposits and various classes of mines, such as copper, galena, and coal of good quality, the ash of which contains vanadic acid of greater value than the coal itself. Attempts upon a small scale have been made to work some of the auriferous deposits as also the galena mines. A railway will soon reach this Territory.

The same remarks apply to the other national Territories more to the south, such as Rio Negro, Chubut, Santa Cruz, and Tierra del Fuego, in all of which minerals exist in the mountain regions. Many concessions of auriferous mines were granted by the national department of mines and geology in the Territory of Chubut, and an English syndicate was formed to exploit them, but no formal works were installed, the larger portion of the capital raised by the syndicate having been expended in the employment of engineers who, so far as is known, made no practical examination of the auriferous deposits when they visited this Territory. None of the mines in the mountain regions ot these southern Territories have been examined officially, consequently no reliable information is to be obtained. The rights to the gold diggings, so called, occurring along the southeastern coast of Santa Cruz and southern coast of Tierra del Fuego, have been included in various concessions.

Deposits of gold were also reported to exist in Sloggett Bay, Tierra del Fuego, and the first engineer of mines of the National Government, Mr. C. L. Hoskold, examined the place, reporting the existence of small lignite deposits. * * *

The Argentine Republic extends over an enormous area and contains immense mineral riches, which, if developed in a proper and economic manner, would produce excellent results. In fact, it is well known to those persons who have had an opportunity of examining the country in a practical and skillful manner that its mines are more varied, extensive, and important than in any other part of South America. But hitherto the want of cheap, efficient, and rapid transport from the mountain regions, where the mines chiefly abound, has been a great drawback. The provincial governments are unable to lay down a good system of transport, consequently the National Government has now turned its attention to this most important subject and is about to provide good and efficient modes of transport. Shortly branch mineral railways will be constructed from the main trunk lines to some of the principal mining districts, and this will give a great impetus to the mining and metallurgical industries; but the application of such a system to all the mining districts must be a work of time and very costly.

H. D. Hoskold,
Director-General National Government Department of Mines and Geology.

Buenos Ayres, *1902.*

PARAGUAY.

[From Consular Report, February 5, 1903.]

Consul J. N. Ruffin reports from Asuncion as follows:

There exist no copper, gold, or silver mines in Paraguay. Some copper is found, but it has never been worked. I have never heard of the existence of silver in the country. Gold, I understand, exists in the district called Missiones, near San Miguel, but it has never been worked and no statistics can be obtained.

URUGUAY.

Mr. William R. Finch, United States minister to Uruguay, furnishes this Bureau with a statement obtained from Señor Alberto Castells, of the industrial and mining section of the department of engineers, of the gold production of that country for 1902, showing that it amounted to 131.337 crude kilograms, valued at $440 per kilogram; the yield was, therefore, 0.662 fine, and its value $57,788, which would indicate a fine contents of 2,795 ounces, or 82 per cent increase over the product of 1901, which was 1,536 ounces.

This gain is doubtless due to the introduction of the cyanide process. All the mines are small and are mostly surface workings. The gold runs from 0.650 to 0.700 fine; and the yield is from 104 to 475 grains per ton.

The following table contains a statement of the gold product of the department of Rivera since 1885. It is extracted, in part, from the Annuario Estadistico de la Republica Oriental del Uruguay, published in 1900, the United States value having been computed at this Bureau at the rate of $1.03424 for 1 peso:

Year.	Weight.	Value.		
		Per kilogram.	Total.	United States currency.
	Kilograms.	*Pesos.*	*Pesos.*	
1885	64.284	500.00	32,142.00	$33,241
1886	85.009	500.00	42,504.00	43,948
1887	63.908	500.00	31,954.00	33,047
1888	25.734	500.00	12,867.00	13,307
1889	139.261	396.80	55,259.31	57,149
1890	207.695	418.59	86,938.09	89,911
1891	212.883	426.26	90,743.76	93,847
1892	121.579	441.16	53,635.97	55,470
1893	102.230	444.83	45,474.55	47,031
1894	34.511	444.56	15,342.39	15,867
1895	61.126	442.39	27,041.32	27,966
1896	55.998	446.50	25,002.72	25,858
1897	87.336	440.89	38,505.71	39,822
1898	74.708	445.00	33,245.06	34,382
1899	41.4			27,514
1900	46			30,842
1901	47.7			31,741
1902	86.945			57,788

The figures for the last four years are taken from the reports of the United States minister, which are based upon information received from the ministry of foreign affairs of Uruguay.

Uruguay's silver production is comparatively insignificant; it is estimated for 1902 at 800 fine ounces, of the commercial value of $424 and the United States coining value of $1,034.

From the above table it will be seen that the yield of gold for 1902 was, with the exception of that for 1897, the largest since 1893. From 1899 the amounts given are fine kilograms.

Gold Mining in Uruguay.

[Consular Report, February 5, 1903.]

Consul A. W. Swalm, of Montevideo, quotes a report on gold mining in Uruguay, published earlier in the year:

"Statistics have been forwarded to this office by the department of the interior of Uruguay in relation to the mining of gold for the past three years. The work has been carried on almost wholly by a French company, and the results are:

"The mines in Rivera produced 5,119 tons in 1899, yielding in gold 61.336 kilograms (139.2 pounds), the total value being $7,500.26. In 1900 7,345 tons of mineral quartz were worked, producing 71.234 kilograms (157.04 pounds) of gold.

"In 1901 6,183 tons were worked, yielding 71.946 kilograms (158.6 pounds) gold. The cyanide process is now adopted, and better results are obtained than before. The mines are all small—mostly surface work—and assays made from twelve workings range from 6.75 grams (104.15 grains) to 30.79 grams (475 grains) per ton. During 1901 twenty-five new applications for mining privileges were filed, all in other departments (Cerro Largo, Minas, Maldonado, Canelones, and Florida). Lack of water is complained of. The Government gets a percentage on all gold produced.

"The concessionnaires hope in time to strike a quartz of marvelous richness. French appliances are used exclusively. All French companies in South America deal only with France."

Silver and copper mining, adds Mr. Swalm, are not known in any commercial way.

EUROPE.

RUSSIA.

Mr. Robert S. McCormick, United States embassador extraordinary and minister plenipotentiary at St. Petersburg, states in answering this Bureau's interrogatories that Russia in 1902 produced 33,905.2 kilograms of fine gold. This would be 1,090,053 ounces and would be worth $22,533,396. This is 15,454 ounces less than were produced in 1901, a decrease of about 1½ per cent.

Russia produced silver during 1902 to the amount of 4,948 fine kilograms, of the commercial value, at $17 per kilogram, of $84,116, equivalent to 158,709 ounces.

The production of gold in Russia from 1816 to 1880, by periods of five years and, subsequently, by years:

	Kilograms, fine.		Kilograms, fine.
Periods:		Years:	
1816-1820	1,269	1885	29,348
1821-1825	9,466	1886	29,734
1826-1830	22,167	1887	30,985
1831-1835	30,522	1888	31,257
1836-1840	34,469	1889	33,118
1841-1845	80,846	1890	34,998
1846-1850	121,543	1891	34,745
1851-1855	113,371	1892	38,223
1856-1860	122,158	1893	39,884
1861-1865	107,026	1894	38,172
1866-1870	134,131	1895	36,543
1871-1875	156,937	1896	33,076
1876-1880	180,766	1897	34,977
Years:		1898	34,166
1881	32,677	1899	33,354
1882	32,138	1900	30,312
1883	31,887	1901	34,383
1884	31,719	1902	33,905

The average annual production of fine gold in Russia from 1816 to 1902, inclusive, was 21,154 kilograms, the low average being due to the small production of the earlier years of the period. The product for 1902 was 60 per cent greater than the average for this period. During this time the production has remained remarkably constant.

Production of silver in Russia from 1822 to 1900, inclusive, by periods of five years, and subsequently by years, is as follows:

Period.	Kilograms, fine (approximately).	Period.	Kilograms, fine (approximately).
1822-1825	66,930	1866-1870	73,306
1826-1830	85,211	1871-1875	51,731
1831-1835	93,780	1876-1880	49,801
1836-1840	89,239	1881-1885	40,262
1841-1845	88,172	1886-1890	64,996
1846-1850	83,896	1891-1895	45,097
1851-1855	77,201	1896-1900	33,204
1856-1860	78,224	1901	4,884
1861-1865	77,542	1902	4,998

GOLD MINING IN SIBERIA.

[From United States Consular Report, March 14, 1903.]

Under date of February 27, 1903, Commercial Agent R. T. Greener, of Vladivostock, transmits a report on gold mining in Siberia by a French mining engineer, from which the following extracts are taken:

"The principal reasons why foreign capitalists have hitherto paid so little attention to Siberian gold placers may be summed up as follows:

"1. The extreme irregularity of the gold deposits, at one point being very rich and at another very poor.

"2. The great difficulty experienced in working poor placers, because (*a*) hydraulic working is, except in rare cases, impossible in Siberia, on account of the lack of water and the want of high pressure, which seldom exceeds 50 to 60 yards, the gold deposits in Siberia being situated in large, flat valleys, with only small streams of water; (*b*) dredgers on pontoon bridges are very rarely possible for the same reason; (*c*) excavators and automatic cables produce an economy of only 30 per cent; (*d*) underground work is restricted and very expensive.

"3. The additional income from the sale of goods to workmen of Siberian companies, which is not permissible to a foreign company.

"4. The extravagant prices demanded for placers already washed over, which are therefore of small or of unknown value, and only to be determined by expensive works.

"This last cause may in a year or two disappear, but the others will remain. It is, of course, possible that rich placers may be discovered which may prove to be profitable investments for foreign capital. The gold veins remain, which are more advantageously situated and will not be so soon exhausted. In these the future of Siberia's gold mining will lie."

THE PLACERS OF SIBERIA.

[By LEWIS B. BROWN. From the Mining and Engineering Journal, New York, May 9, 1903.]

As is well known, the alluvial deposits of Siberia in general are characterized by a covering of matted earth and vegetation, commonly referred to as "turf." For the most part this turf is the material known in America as "peat," and which may be dried and used as fuel. Among the gold miners, however, the distinction between true turf and other material is not sharply drawn. All material in the placers which overlies the plast, or pay gravel, is included under the name "tourf." This may be poor gravel, rounded or angular in character, and occasionally sand; even landslide material is included.

The turf, properly speaking, varies in thickness from 6 inches to 60 feet. Figures from the Lena district of east Siberia give an occasional depth of 150 feet, but I am not sure that this is true turf. It is probably, in part, barren gravel. Analogies between the Siberian deposits and those of Alaska, especially those of the region behind Cape Nome, exist to a remarkable extent.

It appears probable that these turf or peat deposits are primarily the result of the extreme length of time the ground has remained frozen. It is rarely absent even on the barren and treeless steppe area about Troitsk, in the Orenburg government, where it exists in the depressions of the plain as a thin covering. The turf occurs not only in the valleys of the country, but also on the very summits of some of the Altai peaks, which reach to over 7,000 feet. It exists also on the sides of the mountains, holding the water like a great sponge. To this fact may be attributed the remarkable scarcity of visible streams and small brooks. A journey of a whole day along the mountain ridges and through the valleys of the Altai will hardly furnish opportunity for seeing more than a dozen brooks, tributary to the large creeks.

In the gold-bearing valleys of the Marinsk and Achinsk districts the true turf does not exceed a couple of feet in thickness. Underneath this comes a layer of rounded gravel, consisting of débris brought from a distance. This is occasionally mixed with sand and layers of tough clay. Beneath this is a layer of varying thickness of gravel. The last is generally barren. Underneath this comes the pay gravel, from 2 to 8 feet in thickness. This is usually of an angular or subangular character. It resembles the ordinary auriferous gravels of Siberia, but in comparison with those of California it appears to have suffered much less wear and to have traveled a relatively much shorter distance.

One feature which characterizes the Siberian deposits is their remarkable similarity over wide stretches of country. Thus, from Levat's description (L'Or en Siberie Orientale, E. D. Levat, Paris, 1897), it appears that the gravels of the Amoor district are in a few places almost exactly similar to those which I have seen in the Ural and west Siberia, the only difference being in the tenor of the gold and in the fact that the east Siberian gravels are generally frozen throughout the year. See also in this regard De Batz in his descriptions of the Amgoon River deposits (Baron René De Batz, Les Gisements Aurifères de Siberie, Paris, 1898).

FINLAND.

[From Bidrag till Finlands Officiela Statistik, XVIII; Industri Statistik, 18, 1901.]

Finland in 1901 produced 1,974 grams of gold, worth 6,316 Finnish marks ($1,219 in United States money), all of which was obtained from washings, which gave temporary employment to 30 men.

In 1901 silver obtained as a by-product in copper smelting was produced to the amount of 271 kilograms, worth $5,230. This was slightly in excess of the production of 1900.

Production of Gold and Silver for the Last Ten Years.

Year.	Gold.		Silver.	
	Weight.	Value.	Weight.	Value.
	Grams.	*Finnish marks.*	*Kilograms.*	*Finnish marks.*
1891	8,768	28,057	1,038.32	100,000
1892	4,807	15,382	920	90,000
1893	4,120	13,184	888.83	88,000
1894	6,471	20,607	877.54	87,000
1895	9,926	31,765	450.81	45,000
1896	7,115	22,768	375.33	37,000
1897	4,593	14,697	381.19	35,000
1898	4,619	14,780	455.58	48,860
1899	2,620	8,384	244.25	26,000
1900	2,174	6,956	250.5	27,555
1901	1,974	6,316	271	27,100
1902	1,974	6,316	271	23,938

As no figures have been obtained for 1902, those for 1901 are repeated; owing, however, to the fall in silver the commercial value of the product for the last year would be 23,938 Finnish marks, or $4,620.

NORWAY.

GOLD.

The gold product of Norway is exceedingly small and it has steadily and, with the exception of the year 1896, rapidly diminished since 1889. Under date of April 21, 1903, United States Minister Thomas writes that "the yield for 1902 is relatively insignificant, but it may be stated that about one-third of a kilogram was produced during the year in Finnmarken."

Following is a statement of the production since 1889:

Year.	Weight.	Value.	Year.	Weight.	Value.
	Kilograms.	*Crowns.*		*Kilograms.*	*Crowns.*
1889		33,000	1896	14.26	35,000
1890		43,300	1897	1.21	3,000
1891		24,000	1898	2.42	6,000
1892		36,500	1899	4.03	10,000
1893		22,000	1900	3.63	9,000
1894		3,500	1901	3	7,000
1895		8,000	1902	3	7,000

The figures for 1897, 1898, 1899, and 1900 are from the Statistik Aarbog for Kongeriget Norge for 1902, the weights being computed from the value, the crown being reckoned at 26.8 cents. No figures being obtainable for 1901 and 1902, the average of the last four years (for which official returns have been received) is taken, namely, 7,000 crowns, which is equivalent to approximately 3 kilograms, or 95.59 ounces of fine gold.

SILVER.

Regarding silver the minister writes:

> At the Kongsberg Silver Works there was produced from April 1, 1901, to March 31, 1902, about 6,435 kilograms fine silver, which was sold for 408,148.11 crowns. At other works, as far as is known, there has not been any regular production of any importance.

The Kongsberg mines have long been famous for their native silver, which is sometimes met with in masses of considerable size. The picked stuff sent to the smelting works contains 70 per cent of the precious metal.

Norway's production of fine silver since 1889 is exhibited in the annexed table:

	Kilograms, fine.		Kilograms, fine.
1889	5,350	1896	4,664
1890	5,080	1897	5,372
1891	4,680	1898	4,802
1892	4,810	1899	4,598
1893	4,770	1900	4,578
1894	4,760	1901	5,160
1895	5,000	1902	6,435

The estimates for the last two calendar years are based on the monthly averages, as the reports are for fiscal years, which do not coincide with the calendar years.

The figures for 1899 and 1900 are from Norges Officielle Statistik, Norges Bergværksdrift i Aarene 1899 og 1900.

The United States coining value for the yield of 1902 is $253,391 and the commercial value $109,384. At 53 cents, the average price per ounce during that year, this is equivalent to 209,390 fine ounces.

SWEDEN.

Replying to this Bureau's interrogatories, the minister of the United States at Stockholm, Mr. W. W. Thomas, jr., states that Sweden produced in 1902, 94.309 kilograms, or 3,032 ounces of gold, and 1,443 kilograms of silver. Assuming these to have been fine kilograms, the total respective values would be $62,678 and $24,531, commercial value, the silver being computed at $17 per kilogram.

The appended tables contain a statement of the gold and silver production of Sweden since 1861:

GOLD.

Period.	Annual averages.	Period.	Annual averages.
	Kilograms.		*Kilograms.*
1861–1865	14.895	1881–1885	24.796
1866–1870	8.232	1886–1890	77.577
1871–1875	5.133	1891–1895	93.895
1876–1880	5.776		

GOLD—Continued.

Year.	Annual production.	Year.	Annual production.
	Kilograms.		*Kilograms.*
1894	93.603	1899	106.245
1895	85.291	1900	83.483
1896	114.529	1901	62.723
1897	113.318	1902	94.309
1898	125.937		

SILVER.

Period.	Annual averages.	Period.	Annual averages.
	Kilograms.		*Kilograms.*
1861–1865	1,128.9	1881–1885	1,713.0
1866–1870	1,185.3	1886–1890	4,254.2
1871–1875	779.9	1891–1895	3,478.1
1876–1880	1,116.9		

Year.	Annual production.	Year.	Annual production.
	Kilograms.		*Kilograms.*
1894	2,869.5	1899	2,290.3
1895	1,188.0	1900	1,927.4
1896	2,082.3	1901	1,557.3
1897	2,218.2	1902	1,443.0
1898	2,032.9		

GREAT BRITAIN.

This Bureau has received no information regarding the production of gold and silver in Great Britain in 1902, and the replies to its interrogatories for 1901 were received too late to be incorporated in the report for that year, which made it necessary to repeat the estimates for the previous twelvemonth, which, however, it subsequently developed were too high in the case of both gold and silver.

Mr. John Ridgely Carter, of the American embassy in London, under date of November 6, 1902, furnished this Bureau with a statement, obtained through the courtesy of the British foreign office, of the production during 1901, according to which it appears that the gold amounted to 175 fine kilograms, of the value of £23,907, or $116,343, which would represent 5,628 fine ounces; and the silver, 5,427 kilograms, of the value of £21,366, or $103,978, which, at 60 cents per ounce (the average price during that year), would represent 173,297 fine ounces.

The figures for 1901 are repeated for 1902. The commercial value of the silver would, however, owing to the fall in price from 60 to 53 cents, be $91,847, a decrease in the value of the product of $12,131, or 11.6 + per cent.

EGYPT.

Mr. John G. Long, United States consul-general at Cairo, states, under date of February 3, 1903, in reply to this Bureau's interrogatories, that no gold is produced at present in Egypt, but that prospecting is under way.

GERMANY.

According to information received from Mr. R. S. Reynolds Hitt, second secretary of the Unites States embassy at Berlin, the refineries in the German Empire produced in 1902, 2,664.20 kilograms of fine gold, of which 94.09 kilograms were derived from domestic ores, the balance, 2,570.11, having been obtained from foreign ores, and domestic and foreign sweeps. Germany's gold product for 1902 is accordingly placed at 94.09 kilograms, or 3,022 ounces, of the value of $62,472.

The total silver product of the refineries was 430,610.04 kilograms, valued at 30,800,096 marks; of this amount 252,201.33 kilograms were obtained from foreign ores and domestic and foreign sweeps. The balance, 178,408.71 kilograms, was derived from domestic ores, and is accordingly set down as Germany's product for the year; it is equivalent to 5,722,553 ounces, and worth, commercially, $3,032,953; a decrease, owing to the fall in value, of $280,047, as compared with the yield of 1901, but an increase of 212,224 ounces.

The gold and silver reported above as derived from foreign ores is neglected in the estimate of the world's product, it having been elsewhere included; that obtained from sweeps of every nature is also omitted.

AUSTRIA-HUNGARY.

Austria, according to official information received by this Bureau in 1902, produced 73,839 kilograms of gold ore worth 21,140 crowns, equivalent (taking the crown at 20.3 cents) to $4,291, which would represent 6.45 kilograms, or 207.5 ounces of fine gold; a decrease in production as compared with the previous year's output of nearly 34 per cent.

Her yield of silver ore amounted to 22,287,600 kilograms, and was valued at 3,038,774 crowns, equivalent in United States money to $616,871, which would represent 36,286 kilograms, or 1,163,908 ounces of fine silver; a decrease in production as compared with that of 1901 of approximately 70,569 ounces, and a loss in commercial value, caused by the fall in the price of silver, of $125,287. The United States coining value of the product of 1902 was $1,507,547.

Hungary in 1902, yielded 3,261 kilograms, or 104,831 ounces of fine gold, which would represent $2,167,060. As compared with the yield of 1901 the production of 1902 showed a gain of 56 kilograms, or 1,800 ounces of fine gold, worth $37,217.

During the same year the mines of Hungary produced 22,363 kilograms, or 717,304 ounces of fine silver, of the commercial value, at 53 cents an ounce, of approximately $380,171, and a United States coining value at $41.56 per kilogram, of $929,406. As compared with the previous year's production there was an actual decrease of 4,086 fine ounces and a diminution in commercial value, largely due to the fall in the price of silver, of approximately $76,000.

Appended is a statement of the production of the precious metals in the Austro-Hungarian Empire from 1897:

Year.	Gold.		Silver.	
	Kilograms, fine.	Value.	Kilograms, fine.	Coining value.
1897	2,993	$1,989,000	67,952	$2,824,100
1898	2,798	1,859,500	56,443	2,345,700
1899	2,925	1,943,900	58,961	2,450,000
1900	3,223	2,141,900	61,871	2,571,300
1901	3,215	2,136,692	62,118	2,581,617
1902	3,267	2,171,351	58,649	2,436,953

FRANCE.

France produces no gold, and no statistics regarding the production of silver in that country in 1902 have reached this Bureau, but United States Ambassador Porter transmits the final corrected figures for 1901, which are 11,946 kilograms of silver, of the value of 1,194,600 francs, or $230,558, which, at the average price for the year (60 cents), would represent 384,263 fine ounces. It is stated that the output of the refineries amounted to 77,521 kilograms of silver, which included the amounts derived from both domestic and foreign ores, the latter, however, has been taken into account in the world's production for the country where it was produced; the refineries likewise yielded 129 kilograms of gold, all of which was obtained, it is stated, from foreign ore. France's silver yield for 1901 as compared with 1900 fell off 2,121 kilograms, or about 15 per cent.

In the absence of any figures for 1902 the yield is assumed to have been the same as that of the preceding year, viz, 384,263 fine ounces, of the commercial value of $203,659, which indicates a decrease of $26,898, owing to the fall in the price of silver.

SPAIN.

According to official information obtained from the ministry of agriculture, industry, and commerce, by Mr. Stanton Sickles, United States chargé d'affaires at Madrid, Spain in 1902 produced 1,764,000 kilograms of auriferous ore, which yielded gold to the value of 52,920 pesetas, or, taking the peseta at 19.3 cents, $10,214, which would represent 494 fine ounces.

Silver was produced to the value of 127,152 pesetas, or $17,801 (in the case of silver the peseta is valued at 14 cents), which would represent 33,587 fine ounces. The output of the refineries, derived from argentiferous lead and silver ores in Cordova, Guadalajara, Guipuzcoa, Jaen, and Murcia, amounted to 96,975 kilograms of fine silver of the commercial value of 11,730,628 pesetas, or $1,642,888, which is equivalent, at 53 cents per ounce (the average price for 1902), to 3,099,789 fine ounces.

The Économiste Européen for September 25, 1903 (quoting from the report of the inspector-general of mines), states that Spain in 1902 produced silver-lead ore to the amount of 228,000 tons. According to the Revista de Economica y Hacienda, 191,000 tons of argentiferous lead ore were reduced in the country, yielding 74,000 tons of silver-lead, and also 18,000 kilograms of silver ore, which yielded 97 fine kilograms, or 3,111 ounces of silver. Assuming that 37,000 tons—the difference between the amount of silver-lead ore produced by the mines and that reduced in the country—was equally rich in silver, it contained 600,483 fine ounces.

As it is believed that the 3,099,789 fine ounces estimated as the refinery product includes the items 33,587 and 3,111 fine ounces, Spain's silver product for 1902 is placed by this Bureau at 3,700,272 fine ounces, or the amount refined at home, i. e., 3,099,789 ounces, and the estimated contents of the 37,000 tons of ore reported as produced but not reduced, 600,483 ounces, the commercial value of the product would be $1,916,144.

The appended table contains a statement of the production of silver-lead in Spain, in tons, since 1893:

	Tons.		Tons.
1893	178,653	1898	244,068
1894	181,715	1899	184,906
1895	181,433	1900	182,016
1896	182,565	1901	207,000
1897	186,692	1902	228,000

PORTUGAL.

Thus far this Bureau's interrogatories have elicited no definite information regarding the production and export and import of the precious metals in Portugal. The production, however, is slight, so small in fact that it might be disregarded in a statement of the world's output. In the Report of the Production of 1897, basing the figures on the most reliable data obtainable, the gold production was placed at 17 kilograms, worth $10,356, and the silver at 79 kilograms, of a coining value of $3,037.

The following table contains a statement of the production of gold in Portugal since 1896:

GOLD.

Year.	Weight.	Value.
	Kilograms.	
1896	28	$18,528
1897	17	10,356
1898	7	4,700
1899	1.7	1,121
1900	2.6	1,725
1901	2	1,329

The figures for 1899 and 1900 are quoted from Mines and Quarries for 1901.

No data whatever are at present obtainable regarding the production for 1902, and it will be noticed from the above that since 1896 the yield has rapidly diminished, with the exception of the year 1900, when there was a slight increase. It is believed, however, that the figures given represent the product of both the mines and the refineries. The gold production for 1902 is therefore placed at 2 kilograms, worth $1,330 (approximately). The estimate of the silver yield of 1901, which was 3,790 fine ounces, is repeated for 1902, and its commercial value at 53 cents per ounce, the average price during 1902, was $2,009.

ITALY.

The latest report received by this Bureau regarding the production of the precious metals in Italy refers to the year 1901, and places the output of gold at 8 kilograms, of the value of 27,720 lire, and the silver at 29,245 kilograms, worth 2,997,925 lire, equivalent, respectively, to $5,350 and $578,600.

The gold production in 1901, therefore, amounted approximately to 259 ounces, and the silver, assuming it in that year to have been worth 60 cents per ounce, to 964,333 fine ounces.

In the absence of any returns for 1902 these figures are repeated, the commercial value of the silver, however, being reduced, to $511,096.

GREECE.

Gold does not exist in Greece in quantities sufficient to render mining profitable. It is, however, found in the alluvium of the island of Scyros and in the iron pyrites of Poliana, and in small quantities in the silver extracted from lead of Laurium. Silver is found in all the lead ores of the country which contain from 250 to 4,000 grams of silver to the ton of metal.

According to the Statistique de l'Industrie Minerale for 1901, Greece in that year produced 34,237 kilograms of fine silver, of the value of 3,389,000 francs, or $654,077, equivalent, at 60 cents per ounce, to 1,090,128 ounces. In the absence of any data for 1902 the yield is assumed to have been the same, and its value is estimated at $577,768, a decrease of $76,309.

TURKEY.

This Bureau has received no report on the production of the precious metals in Turkey in 1902. It is therefore necessary to repeat the estimates for 1901, which are derived from the Statistique de l'Industrie Minérale, and are as follows: Gold, 46 fine kilograms, of the value of $30,572, equivalent to 1,489 fine ounces; silver, 480,570 fine ounces, worth $288,342 (in the case of silver the commercial value must be reduced to $254,702).

It is stated that argentiferous galena is worked at Balia and at Avnie, and that the ore yields about 82 per cent of lead and from 1¼ to 4 per cent of silver.

Production of the Precious Metals.

[From the report of the director of the French mint for 1901.]

Year.	Gold.		Silver.	
	Weight.	Value.	Weight.	Value.
	Kilograms.	*Francs.*	*Kilograms.*	*Francs.*
1893	13	44,240	7,165	740,167
1894	12	38,010	7,809	809,872
1895	8	26,595	10,208	884,415
1896	10.7	35,497	7,007	743,445
1897	21.9	73,457	7,110	516,254
1898	21	72,300	4,422	982,500
1899 [a]	21	72,300	4,422	982,500
1900 [b]	37	127,000	13,352	1,335,000
1901 [b]	46	159,000	14,942	1,494,000

[a] Figures for 1898 repeated.

[b] From the Statistique de l'Industrie Minérale, 1901.

PERSIA.

Mr. John Tyler, United States vice-consul at Teheran, writes, in answer to this Bureau's interrogatories:

> Assuming that there are gold and silver deposits in Persia, no mining operations are carried on in the country.

Writers on Persia state that mines of lead and copper exist in nearly all the provinces and have been worked from ancient times, but there are many considerable deposits still untouched. Some of the lead ores are argentiferous, but the precious metal is not extracted. Auriferous sands are plentiful, but it is doubtful whether they could be profitably worked.

ASIA.

CHINA.

China prepares no official statistics of her gold production. This Bureau, therefore, is compelled to have recourse to statements of imports of Chinese bullion into other countries.

From official reports of the German Empire it is learned that her imports of gold bullion from China in 1902 amounted to 8,844 kilograms. Assuming this to have been fine, it was worth $5,877,722, which would represent 284,334 fine ounces.

India imported from China, in 1902, 102,699 ounces of gold bullion, which are assumed to have been of standard fineness, 0.916⅔. The fine contents would be 94,141 ounces.

According to the Trade Returns of Great Britain, the United Kingdom imported no gold from China in 1902; and in the absence of any data regarding Japan's imports for that year from the same country, they are assumed to have been the same as they were in 1901, which were estimated at 43,924 fine ounces.

Assuming, therefore, that China's gold production in 1902 was equal to her exports to these three countries, which doubtless receive nearly if not all her yield, she produced in that year 422,399 fine ounces, of the value of $8,731,762, or approximately 4 per cent less than her estimated yield for 1901.

KOREA.

It has been exceedingly difficult to form even an approximately close estimate of the amount of gold produced in Korea. In former years it has been stated that the yield was equal to the amount of declared exports plus the amount clandestinely taken out of the country, which was estimated to be at least equal to the declared exports and by some to be 50 per cent greater. While this may in early years have been fairly correct, it is admitted that conditions have now changed, owing, as Mr. Horace N. Allen, United States minister to Korea, states—

> to the fact that the best mines are now controlled by foreigners, which decreases the native output. In the second place, it was formerly the custom of Chinese traders to handle much of the interior trade, taking their pay in gold dust, which was convenient of carriage; now this trade is mostly in the hands of the Japanese. While the Chinese used carefully to smuggle out their gold, the Japanese ship it through one of the Japanese banks. The chance, therefore, is now that the declared export exceeds that undeclared. As to the proportions, I am unable to make any statement that would be of value to you. The only statistics are those of the customs and the Chinese banks.

Mr. M. Takaki, manager of the Seoul branch of the Dai Ichi Ginko, or First Bank of Japan, states:

> After careful investigation, with the assistance of our assay department, I am able to give the following figures for the amount of gold exported in 1901 from the Korean ports: 5,363.424 kilograms. This estimate is pretty accurate.

This would indicate a value, assuming it to have been fine, of $3,564,531, which, after adding a reasonable amount to represent the clandestine exports, would substantially confirm this Bureau's estimate for 1901—i. e., $4,500,000.

Mr. Allen states that the declared exports during 1902 were valued at 5,064,106 yen, equivalent to $2,521,924, which would represent 3,795 kilograms, or 121,998 fine ounces. There was therefore a decrease in the value of the declared exports of $1,042,607. Assuming that the clandestine exports did not vary greatly from those of 1901, this Bureau estimates Korea's gold production for 1902 at $3,500,000, equivalent to 5,266 kilograms, or 169,312 ounces fine.

Korea produces no silver.

MINING IN KOREA.

[By S. J. SPEAK, A. R. S. M., Assoc. Inst. M. M. From The Mining Journal, Railway and Commercial Gazette, London, February 28, 1903.]

Korea is not open to foreigners for mining, with the exception that one subject each of the great powers may secure one concession. Until recently only the Americans, British, Germans, and Japanese had located their concessions. The principal terms on which these concessions are granted are that mining supplies may be imported duty free and that the King shall receive 25 per cent of the profits. The American concessionaires compounded for this tax on profits by a fixed payment of about £2,500 per annum. Other concessionaires will on this precedent be able to claim the same terms. As yet the American concession, which is situated in the northwest of Korea, near the Manchurian frontier, and has an area of 400 to 500 square miles, is the only one which has arrived at the producing stage.

Considering the situation and the size of the concession its financial history is probably unique. Starting about five years ago with 10 light stamps it has without further capital developed and equipped itself with 200 stamps. At first the only practicable route to the mine was via Seoul, a distance of about 250 miles. Later a route was opened by water transport to Ping Yeng, and from thence about 120 miles by land. Now, by a well-organized service of schooners and flat-bottomed boats the company is able to land most of its goods during the period of summer rains direct to the concession, within 30 miles of all its mines.

The principal mines now being worked are: Group A, Chittabalbie (20 stamps) and Maibong (40); Group B, Kuk San Dong (20); Group C, Tabowie (40) and Taracol (80 in course of erection). In addition there are several mines where prospecting or development is going on, and there are also several mines let on tribute to natives.

The three groups mentioned above are about 22 miles apart, and consequently each has its own superintendent. All the mines are quartz ledges and granite. The mills are provided with vanners, but have no cyanide plant for the tailings. In the case of one mine the concentrates, which are very rich, are shipped to America, but as a rule are cyanided on the spot.

Water is plentiful, except for a short period during the height of the winter. Lumber, mining timbers, and cord wood, though not too plentiful, are cheap owing to the cheap labor, but steps are now being taken to develop a water-power scheme in order to preserve the timber.

LABOR.

Labor is generally plentiful, but considerable difficulty is met with in obtaining suitable white foremen and overseers, who are mostly obtained from the Western States under contract, and, as in similar cases all the world over where personal selection is not possible, are not always satisfactory. Japanese are largely employed as carpenters, blacksmiths, and engineers, and many of them are excellent workmen; their wages are mostly 3s. per day, but a few get more. Chinese are largely employed as surface coolies in the mills and cyanide works, and to a limited extent underground. They are also indirectly useful in preventing labor troubles; they do not mix with the Koreans.

The ordinary wages of a Chinaman is 10½d. per day. Koreans are employed for the rest of the work; their carpenters are expert adze men, and as miners and tool sharpeners become very efficient. At a recent drilling contest, the winning double-handed team, using seven-eighths-inch steel drills, sharpened in the ordinary way, finished 22 inches in a granite bowlder in ten minutes.

The pay of an ordinary Korean cooly is 7½d. per day, and of a miner or carpenter, 1s. 3d. per day. No food or lodging is provided for any of the Oriental workmen. Koreans run most of the hoisting engines, and no serious accidents have occurred. After allowance is made for the difficulties of language, it must be said that these Japanese, Manchurians, and Koreans are as intelligent and as capable of receiving instruction as a European would be who had been brought up without knowledge of our methods. A Korean is not so conservative as a Chinese.

The main principle on which this labor is managed is to have all natives work under the direct supervision of white men without any intermediate native foremen. With proper organization the number of laborers a white man can look after is mainly determined by the extent of ground they are spread over. At the Tabowie mine, for example, 8 levels are open, and one white overseer is required to look after 4 levels. The overseer examines every hole drilled to see if it is of proper depth and correctly placed, and that it is a suitable hole for a charge of one-fifth of a pound of dynamite; the overseer also must be wide-awake to the possibilities of miners omitting to blast their holes and stealing the dynamite. He also keeps a careful tally of steel and tools in use and of candles. After a short experience the overseer finds he can do this without much trouble, and can very quickly detect delinquents. Most of the overseer's time is occupied in superintending the timbering and the tramming of the ore.

The ground is not hard, but it all requires dynamite and also requires timbering throughout. The stopes vary from 4 to 15 feet, averaging, perhaps, during May about 8 feet; all stopes are timbered, square sets being used in the large stopes. The occurrence of the ore shoots is somewhat complicated and not conducive to cheap systematic stoping throughout. The bulk of the ore during this month was hoisted from the shaft.

COSTS.

The total expenses were: Europeans, £130; native wages, £270; stores, shops, cooly gang, etc., £240; total, £640, equal to 4s. 5d. per ton mined on 2,904 tons.

In June, with 3,220 tons of ore mined, the total costs equaled 3s. 8d. per ton, and in July, with 3,350 tons, 3s. 5d. per ton.

These costs include all maintenance and construction expenses during the period, and also an amount of development work exceeding the stoping requirements. They include assaying costs, but not surveying nor expenses of general management. The stores are, however, charged to the mine at a slight profit, and the actual native wages paid was about £30 per month less than stated above owing to the present low price of silver. The discount on silver is credited to general expenses.

It will be noticed how rapidly the costs diminish with increased tonnage; it is largely on this account that during the period under review the costs of mining in other places on the concession averaged 5s. to 6s. per ton. The different mines also vary much in working facilities and in hardness of the rock; where the rock is hard less timber is required, which nearly compensates matters.

On the whole, mining costs in Korea may be roughly estimated thus: With a stoping width not less than 4 feet, and where there is not an excessive amount of dead work, the total cost of mining will be from 4s. to 5s. per ton. This would cover all ordinary costs, but would be exclusive of new hoisting engines and boilers or shafts.

In milling and concentrating recent costs have been as follows: Tabowie mill, 40 stamps with vanners and canvas plant, May, 1902, 4,008 tons milled; cost per ton 1s. 8.8d. June, 1902, 4,130 tons milled; cost per ton, 1s. 7.5d. July, 1902, 4,589 tons milled; cost per ton, 1s. 7.1d.

This mill is run by steam power, wood being used as fuel; the screen used during May and June was equal to 35 mesh, and during July, 30 mesh. The mill is not new, and the costs include all maintenance and repairs of both mill and vanners, as well as assaying and bullion-smelting costs. There are other mills on the concession working at approximately the same costs. For a mill and plant of 40 stamps a fair average cost of working would be 1s. 9d. to 2s. per ton, according to price of fuel and situation. In the mills Chinese become very efficient, as they are usually experts at sign language; white men must, however, invariably be present. The work accomplished with this class of labor in Korea shows what may be hoped for in the future in mining in the temperate zones of the Far East.

"King Solomon's Mines," or the Land of Ophir.

[Extract from an article written by Willis G. Dodd for the Mining and Scientific Press, of December 27, 1902.]

The Manchurian peninsula, known as Korea or the home of the hermit nation, situated to the northeast of China between latitude 34° and 43° north and longitude 130° east, has long been noted for gold.

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The Korean peninsula is about 600 miles long and has an average width of about 135 miles from east to west, giving an area of approximately 81,000 square miles. It is divided from Russian territory by the Yalu and Amnock rivers, and as a whole is decidedly a mountainous country, but possesses innumerable valleys and foothills, well watered and under a high state of cultivation. The west coast is fringed with one of the most beautiful archipelagoes known, many of the islands being thickly populated and well cultivated. There are few good harbors and only one or two navigable rivers, and these for only a short distance from their mouths.

The geological formation of Korea is simple; it abounds in mineral wealth which is undeveloped. The climate is the best and healthiest to be found in the Orient, Europeans being entirely free from climatic maladies that seem to prevail in other parts. The summers are temperate, winters quite cold. Average rainfall about 40 inches, one-half of which falls during the months of July and August, rendering travel during this period very difficult.

The population of Korea is variously estimated from 12,000,000 to 15,000,000; capital, Seoul, 150,000; second city of importance, Pingyang, 60,000. The government is practically a despotic monarchy.

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All the mines belong to the King, but gold mining, both alluvial and quartz, is carried on throughout the peninsula under a tribute system. The Korean is the miner of the Orient; at placer mining he is an expert, in quartz he performs wonders, considering the facilities he has at his command. At water level he has to stop, so that the gold quartz mines of Korea, and they are many, are really undeveloped, merely prospected.

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Mining concessions have recently been granted to Americans who are operating on quite an extensive scale and with the most modern appliances, the returns from which indicate that the ancient Ophir is still a land of gold. Steam and electric railroads are being built. Noble men and women, graduates from some of our best medical colleges, are working in the missionary field with most gratifying results, and it seems safe to predict that, at no distant future, this long-lost land of Tarshish will take its place as one of the progressive nations of the Orient.

SIAM.

While it is stated that alluvial gold exists in Siam, especially near Lophburi, and that reef mining has been carried on at Kobin and Wattana, the answer to this Bureau's interrogatories for 1902 stated that no gold-mining operations were carried on in Siam during that year. The yield in any case must be so slight as to be a negligible quantity in the statement of the world's production.

BRITISH INDIA.

According to figures furnished this Bureau through the United States consulate at Calcutta by the acting director-general of statistics of the government of India, that country in 1902 produced 16,099 kilograms of standard gold, valued at £1,970,235, equivalent (rating the pound sterling at $4.8665) to $9,588,147 in United States money, which would represent, approximately, 14,428 fine kilograms, or 463,827 fine ounces. Although this gold is reported as "standard" (the British standard is 0.916⅔), the figures indicate that the fineness of the gross amount was 0.896.

The following table shows the gold production of India from 1892:

Year.	Fine Weight.		Value.
	Kilograms.	Ounces.	
1892	4,576.916	147,150	$3,041,818
1893	5,740.166	184,541	3,814,914
1894	5,840.083	187,756	3,881,319
1895	7,006.083	225,243	4,656,243
1896	9,224.416	296,552	6,130,547
1897	10,904.666	350,596	7,247,241
1898	11,708.583	376,412	7,781,524
1899	13,028.583	418,850	8,658,796
1900	14,197.333	456,435	9,435,548
1901	14,138.000	454,528	9,395,932
1902	14,428.000	463,827	9,588,147

It will be seen from the above table that the yield of 1902 was the largest since 1892, exceeding that of the preceding year by 9,299 fine ounces, a gain of, approximately, 2.4 per cent.

India produces no silver.

JAPAN.

This Bureau has received no direct returns regarding the production of the precious metals in Japan, but, according to the report of the director of the imperial mint at Osaka, for the fiscal year ending March 31, 1902, it appears that Japan (including Formosa), during that period, produced 513,173 mommes of fine gold, equivalent to 62,258 ounces, and worth $1,286,987. In the absence of any data covering the calendar year 1902, these figures are assumed to represent the production for that year.

The silver that reached the mint, contained in parting metal, amounted to 3,219,749 mommes, or 390,555 fine ounces, of the value, at 53 cents per ounce, of $206,994. The amount of silver bullion imported into Japan in 1902 exceeded that exported by 55,694 yen, or, approximately, $27,700, equivalent to 52,330 fine ounces. Consequently, the amount given above, as having reached the mint, 390,555 fine ounces, is assumed to have represented the production for 1902, although this quantity is much less than has hitherto been credited to Japan.

Mining in Formosa.

[From the Mining Journal, London, August 15, 1903.]

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According to a recently published work by the United States consul, Mr. James W. Davidson, though records exist of gold having been worked by Chinese from the mainland as early as 1430, the industry, as a continuous one, dates only from 1890. The circumstance that workings were then seriously undertaken by the Chinese was due to the fact of so many of them being returned emigrants from Australia and the United States, where they had learned something of the occurrence and methods of working of placer gold. It was not till four years later that quartz reefs were discovered at a place where one of the Japanese companies are now at work. The bulk of the gold discovered hitherto is situated in the extreme north and northeast of the island around the port of Kelung, but discoveries have also been made at Giran, some forty miles to the south, and on the Tokiri and Kirai rivers, somewhat farther still to the south. Near the extreme south of the island, on the western coast, at Fuko, a landslip has revealed the existence of other deposits; but, as will be seen, all the discoveries at present are on the coast, and in the eastern portion of the island attempts to work the deposits have led in more than one instance to the extermination of the miners by the savages. As the Japanese mining law is in force, Japanese subjects alone are allowed to mine, and, further than this, the shareholders in mining companies are similarly restricted.

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The Fujita Company has a claim of some 1,520 acres, and works mines at Kyu-fun. The gold is said to occur in soft sandstone, and is closely underlaid by two seams of coal, which supply the necessary fuel. The works have hitherto been carried on on an experimental scale with a ten-stamp battery, and the ore treated has averaged about 26 pennyweights. It is now intended to lay down a large plant, including a tramway to the mill, electric plant, and a pier to facilitate transport. The Tanaka Company, which is working a formation which occurs in igneous rock, is situated somewhat farther to the east. Here operations are on a larger scale than the Fujita Company have as yet attempted, and the mine is said to have averaged the high figure of 5¾ ounces. As in the case of the Kyu-fun mines, the Japanese seem to have found it possible to open the mines by adits. Besides the prospects of quartz mining, the country appears to offer considerable opportunities for hydraulic working, whether by dredging or sluicing, as the present Chinese system of working appears to be very wasteful, not only in the amount of gold lost but also in the disturbance caused to unworked ground. A recently issued consular report gives the output and value of the gold produced in the last three years as 12,309 ounces (£41,914) in 1900, 34,202 ounces (£116,770) in 1901, and 48,400 ounces (£168,626) in 1902, but as the customs' figures are far from being representative, the real totals are probably considerably greater.

EAST INDIES.

BRITISH EAST INDIES.

According to the Report (preliminary) of the Department of Mines of Western Australia for 1901, New Guinea, during the fiscal year ending June 30, 1901, produced 9,188 ounces of gold, valued at £32,646, equivalent to $158,872, or 7,685 fine ounces, which is assumed to have been the product for the calendar year. Many parts of New Guinea are gold bearing; nearly all the deposits are alluvial.

Mines and Quarries states that in Sarawak gold is extracted from quartz, the mills at Ban and Bidi crushing about 15,000 tons a month. All gold is extracted by the cyanide process, and the product of 1901 is placed at 30,000 ounces, which in the absence of later data is assumed also to have been the yield for 1902.

In the Federated Malay States the most important mining centers are in the province of Pehang, where quartz veins are worked. The Raub concession is by far the most important, it having yielded since 1897 annually 12,000 ounces.

Assuming the product of Sarawak and of the Federated Malay States to have been fine, the gold product of the British East Indies for 1902 is estimated to have been worth $1,027,089, equivalent to 49,685 fine ounces.

GOLD MINING INDUSTRY OF PAHANG.

[From the Board of Trade Journal, London, November 27, 1902.]

In the annual report by the acting British resident of Pahang for the year 1901, which is published in the Reports on the Federated Malay States for 1901 (Cd. 1297), the following table, showing the output of gold in Pahang for each of the last six years, is given:

	Ounces.		Ounces.
1896	21,300	1899	18,507
1897	26,420	1900	17,048
1898	22,200	1901	23,948

Speaking generally, the acting warden of mines writes as follows with regard to the gold mining industry of Pahang:

"Divers opinions have been expressed with regard to the future of reef gold mining of Pahang, many of them adverse. I venture to think that all decided opinions are premature. No reef gold mine in the country has yet sunk 500 feet below the surface, consequently no mine has yet been proved in depth. Apart from this, the country is covered with heavy jungle and soil, consequently outcrops are difficult to locate, and the want of adequate transport facilities and communications add to the difficulties of the prospector. Existing mines have for the most part been opened up where natives have worked years before the Europeans set foot in the country. Deep gold mining in Pahang is still in its infancy, and neither in prospecting nor in actual mining has sufficient work yet been done to justify any conclusive opinion. In the meantime the result of work done by the various companies mining the Raub reefs is distinctly encouraging. Greater facilities for transport will doubtless come in due time; meanwhile these mines have water power available, and the surrounding jungle provides a well-nigh inexhaustible supply of timber well suited both for underground and surface use.

"A great deal has been said, but nothing done, in the matter of dredging. Gold is to be found in the river sands of the upper waters of the Pahang River, and there would appear to be no reason why a careful examination of the river sands should not give results which would justify the working of dredges in the State. * * *

"It is somewhat astonishing to see the manner in which the alluvial gold has been hitherto neglected by the mining companies, considering that it is probable that the greater proportion of the gold won in early days in Pahang—which gave Pahang its reputation as a gold-producing country—came from these deposits where gold occurs in places not only as nuggets but as dust in the surface soil. This appears to be impregnated with gold in the same manner as is much of the surface soil of the Kinta district in Perak with tin ore.

"The Malays of the interior depend to a great extent on these deposits, and when all else fails, and they are compelled to seek other work, they wash sufficient gold to support themselves and their families.

"It is probable that many of the deposits in Pahang are peculiarly adapted for the system of mining known as 'hydraulic,' which, for many reasons, should be encouraged. It can, I think, be carried on without damage to property or rivers, and has the merit, in the absence of efficient labor, of not requiring so much as the ordinary system of open mines."

DUTCH EAST INDIES.

In the Dutch East Indies the chief gold workings are in Borneo, where there are three well-marked auriferous districts, viz, Sambas, in western Borneo; a second at the sources of the Kehajang and Kapuas rivers, in central Borneo, and a third in the southeastern corner of the island.

Under date of March 13, 1903, United States Minister Newell, at The Hague, states that in 1901 the gold production of Borneo amounted to 1,737 half-thails (one thail equals 0.05409 kilogram), valued at from 58 to 80 florins (that is, $23.31 to $32.16 per thail). Moreover, the concession "Loemai" produced a value of $10,000 (Mexican).

Sumatra delivered 582 kilograms of refined gold, while 12,000 tons of ore, containing, on the average, 270 fine grams, formed the output from the "Soemalate" concession; and 33 kilograms were obtained from the "Totak" concession, both in the Celebes. The concession "Phaleleh," situated in the same island, produced 143 kilograms, fine, of the value of 198,000 florins, or $79,596; tailings to the value of 46,000 florins, or $18,592, and 300 tons of full ore, valued at 79,000 florins, or $31,758.

According to Mines and Quarries for 1901, the Dutch East Indies in that year produced 463 kilograms of fine gold.

Gold has long been worked by the natives in Java, and also in the north arm of Celebes, and within the last decade European companies have commenced work in three islands.

The chief gold workings in Sumatra are at Redjang Lebong, in the southwestern part of the island, which in 1900 produced 350 kilograms, or 11,253 ounces, of fine gold, and 2,300 kilograms, or 73,947 fine ounces, of silver.

The Statistique de l'Industrie Minerale for 1901 states that the Dutch East Indies in that year produced 853 kilograms of gold, worth 2,938,000 francs, or $497,034, which would represent 24,042 fine ounces, and 3,727 kilograms of silver, worth 368,000 francs, or $71,024, which, at 60 cents per ounce (the average price in 1901), is equivalent to 118,373 fine ounces.

According to the above figures, this Bureau's estimate of the production of the precious metals in the Dutch East Indies during 1901 would have to be revised, the actual gold yield having been 2,999 fine ounces, or approximately $62,000, and the silver, 37,718 ounces, or $22,630, in excess of that estimate; consequently the revised figures for 1901 are as follows: Gold, 24,042 fine ounces; silver, 118,377 fine ounces.

From unofficial sources it is learned that in 1902 there was an increase in the production of gold by the Redjang Lebong mines, in Sumatra, as compared with 1901, of about 3,270 ounces. Assuming that the yield of other regions remained constant, the total gold production of the Dutch East Indies for 1902 is estimated to have been 27,312 fine ounces, of the value of $564,589. During the year 1902 the same mines produced 118,225 ounces of silver, which is assumed to represent the entire product of the islands. Its commercial value was $62,659—a loss in value, as compared with the yield of the previous year, of $8,275, owing to the fall in silver.

The appended table, showing the gold production of western Borneo and Palembang for a number of years, is from the Jaarciffers voor het Koninkrijh der Nederlanden Kolonien, 1900:

Year.	Western Borneo, gold.	Palembang.	
		Gold.	Silver.
	Kilograms.	*Kilograms.*	*Kilograms.*
1891	94		
1892	98		
1893	136		
1894	112		
1895	111		
1896	96		
1897	98		
1898	119		
1899	103	10	58
1900	61	352	2,292

GOLD MINING IN SUMATRA.

[From the Engineering and Mining Journal, New York, April 11, 1903.]

During 1902 the Redjang Lebong mines, in Sumatra, produced 22,456 tons of quartz ore, of which 16,435 tons were treated, with a yield of 21,982 ounces gold and 118,225 ounces silver. The remaining 6,021 tons are reserved, in the form of slimes, for further treatment. In all about 10,000 tons of slimes were produced during the year, but the slimes plant had to contend with many difficulties, and from the quantity remaining it is evident that it was unable to cope with the output. Two large Dehne filter presses have been sent out and are now erected, and it is confidently expected that a much greater quantity of slimes will be treated during the current year. The number of stamps at work during 1902 averaged between 20 and 25, from January to August, inclusive; during September and October, however, owing to unprecedented drought and consequent want of water power, only about an average of 9 heads were kept going. For November, 25 were operated, and for December, 30. The mine possesses 40 stamps, and the full number is now at work.

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THE PHILIPPINES.

[By FREDERIC O'BRIEN, special correspondent of New York Commercial.]

MANILA, *January 15, 1903.*

Despite statements to the contrary, the Philippines are rich in precious and useful minerals. Albert P. Wright, an authority on the subject, says that the outcrops of mineral veins and leads are numerous and extensive throughout the whole archipelago, and carry various kinds and classes of metals, including gold, silver, copper, lead, cinnabar, iron, coal, cobalt, nickel, titanic, and tungstate of iron, in such large bodies that millions of capital would be developing them were they in the United States.

Besides, there are indications of the existence of mercury, molybdenite, stibnite, graphite, and platinum. In addition to the above there are building and paving stones second to none and in vast quantity; there are clays suitable for brick and pottery manufacture, and there are extensive deposits of gypsum and limestone.

But inexperienced miners, prospectors, and gamblers have failed in many parts of the Philippines to realize dreams of great fortunes aroused by the stories of natives, and have rather given mining a black eye. The fact is that there are great difficulties in the way of success, though not difficulties which can not be overcome by energy and skill and the outlay of capital.

Money is the greatest requisite, and even money must be accompanied by experience and skill. The Chinese have been buying gold and copper from the natives of these islands for over three hundred years. The mining bureau records for many years past show a considerable output of metals, while the results of surface investigations by American miners from Aparri to Jolo encourages the belief that with proper deep explorations large bodies of valuable minerals will be found.

One can hear in the Philippines of many disastrous attempts at mining in the past, and in the mineral belts of the archipelago dozens of monuments to the ignorance and bad management of the mining companies may be seen. Wright says that these efforts have proved fruitless in many instances, because the miners do not apply the ordinary business principles found necessary in other successful enterprises, or from absolute want of knowledge of the physical conditions of the outcrop of deposits or veins, and the requisite experience to explore and extract economically the ore bodies. Other failures may be attributed to jumping at conclusions and investing large sums of money in the erection of reduction works and mills and afterwards putting men to work to find ore to feed them, a fad for palatial buildings for superintendents, and the lavish entertainment of visiting directors.

Many have built too high expectations on small seams of ore because they carried high-grade values, and on attempting to supply a 5 or 10-stamp mill have found that the mills had to lie idle two-thirds of the time, with interest on the investment eating up the limited profits.

Besides, the rigorous conditions imposed upon the mining industry by the Spanish law contributed not a little to the hardships of the miner. Excuses were constantly being found to levy fines and contributions and the carrying out of imaginary requirements, sufficient in themselves to have caused failures in a majority of cases. Under American rule these things are altered, but further legislation is claimed to be needed.

One of the most reliable authorities on Philippine mines says he has visited almost every known mineral belt in the Philippines, and, from surface indications and such examinations as could be made, he is convinced that the future mining outlook here is exceedingly bright. The ores occur in good strong bodies, but usually of a low-grade character, and the values are easy of extraction.

From some 200 assays had from different districts, it is reasonably sure that the gold ores are of a much higher grade than those of the Transvaal, Douglas Island, Alaska, and many of the large dividend-paying mines of the United States.

An inexhaustible source of water power is found almost everywhere for the generation of electric current and the operation of machinery; there is an abundance of the finest timber and the certainty of coal deposits of coking quality for furnaces in the southern islands. So it is reasonable to say that the mining of ores and the extraction of their values can be done as cheaply here as in any other mining country.

What is most needed is capital and thorough development. There is no reason why within a few years the output of Philippine mines should not rank with that of other mines. The mining laws for the Philippines passed by the United States Congress are not satisfactory, but they permit a successful working of natural resources and will doubtless be amended within a short time.

Wright says that probably in no other country does gold occur in more different kinds of formations and in more varied classes of combinations with other minerals than in the Philippines. Not that there are richer or more extensive bodies and grades here, but they are more widely distributed for the extent of the area embraced in the archipelago than perhaps in any other known section.

No doubt the general occurrence of gold and distribution account in a measure for many stories and general impressions relative to rich alluvial deposits in different parts of the islands. Nearly all the rivers and water courses having their sources in or near the mountains have brought down and deposited in their sands and gravels fine particles or "colors" of gold, and in some instances small pieces which are nearly the size of nuggets.

No very rich flows have been found yet, and few if any deposits have demonstrated very great values or encouragement that they will pay to work with the usual methods and most modern saving appliances. This, however, does not prove there are no paying grounds or sands in the Philippines.

For centuries the natives have washed gold from the gravel beds of streams in the most primitive manner, and have been content to live off their earnings despite the richness of the nearby forests, which makes it reasonable to presume that, with economical administration and the energy and skill of the American miner, desposits and beds carrying precious metal may be found that will give big returns.

The most important thing for the prospector is to find the source of original occurrence of the gold which is so generally distributed throughout the islands. The presence of gold in beds of streams and gravel bars is evidence of veins, lodes, or deposits that originally contained the metal, and, by reason of chemical changes, disintegration, or erosion, have given up the free gold for distribution by the rains, floods and torrents that are so frequent in this latitude.

Wright does not believe the theory that the fine particles of gold were at some remote age thrown up through craters of volcanoes now extinct, and in the same manner as volcanic ashes scattered in all directions. If this theory were correct, he says, all parts of the ground would be gold bearing in nominally equal amounts.

This is not the case, and, further, gold heated to the degree which it would be in a volcano would volatilize and combine with various other elements and be precipitated in entirely different forms from those of the free gold found.

The reasonable conclusion is that somewhere higher up the mountain range, and within the area drained by any given gold-bearing river or stream, there are veins or deposits of gold-bearing rock that from physical causes have been made to part with their free values, which the floods and waters have been the agents in forcing down the course of the stream and depositing in the alluvia of the same. The wise prospector will follow the gold-bearing flow upstream, and not downstream, in search of the metal, and he will not peer down craters in his search for origin.

No general rule can apply in the Philippines as to the kind of rock in which gold occurs, or the character of its embedment, from the facts that primary rocks are extensively covered by modern volcanic overflows, and such occurrences of gold as have so far shown are found mostly in these volcanic rocks.

Most of the serpentines, as in the Camarines, Masbate, and Mindanao, carry low-value gold in the oxidized seams, and small stringers of quartz and calcites are found in them. This is true also of some of the metamorphic states, as in several of the districts of northern Mindanao, on the Pacific side of the province of Surigao. But it is in the diorites, porphyries, trachites, and other modern igneous rocks that gold most frequently occurs and in larger and better defined veins and deposits, showing higher grades of ores and with better evidence of continuity, whether as free gold or in combination with other metals, than in the other classes of formations.

The more recent volcanic overflows are strongly impregnated with iron in most of its forms, containing in many cases such a high per cent as to render the body of the country rock itself very much disintegrated and chemically changed. The oxides and sulphides, in nearly all instances, carry gold in varying proportions, and where they occur in the intrusive porphyries, which are very frequent, or in the quartz veins themselves, they usually carry a value that adds materially to the net worth of the ore.

In districts where copper predominates gold is, in nearly every instance, found in considerable strength in combination with the different classes of copper ores, and will, when the copper ores are worked, play an active part as a by-product. In the Mancayan and Suyoc districts of Lepanto Province nearly all copper ores run as much as 9 per cent per ton, and fire tests show from $4 to $8 per ton. The same is true of Zambales and the Camarines.

From the central part of Lepanto Province there is a large and well-defined mineral belt extending almost due north and south to the province of Rizal. Within the length of this belt are found surface indications and outcroppings of mineral-bearing rocks seldom met with in any country. Included are copper, iron, cobalt, nickel, and gold-bearing rocks nearly the entire length.

In Benguit Province are the largest and best free milling propositions, but with less indications of copper than in Lepanto. The section near Baguio promises very well, as the veins are large and the values mostly free, with every necessity at hand for economic working.

The ores occur very much as at Mancayan and Suyoc, save the veins are distinctly quartz and the values easier of extraction. There are several propositions in this district only waiting for capital and intelligent development to make them large producers and beyond question remunerative.

At the extreme northern part of Luzon there are two large agglomerate beds which, when conditions are better, can be milled and made to produce large dividends. Though low grade, they would pay handsomely on a big scale.

For many years the natives have extracted gold from these beds by crushing between stones and washing out the gold. Auriferous sands and gravels below these beds along the river which flows across them have also been worked by the natives.

The gold found along the gravel beds and sands of the Bagbag, Puray, and Mariquina rivers has undoubtedly come from the large dykes which cut diagonally the mountains near their sources. Some of these dykes are exceedingly large and heavily impregnated with iron pyrites, and oxidizing near the surface the sulphur has been driven off and the gold freed from its combination.

So far I have dealt with natural advantages and disadvantages, but the question of labor is one of the most serious confronting the ambitious miner, and with the restrictions of the law and the problem of transportation forms a trilogy for deep discussion.

The acting chief of the mining bureau of the Philippines says:

"It must be taken as a hopeful sign that the present impossibility of securing satisfactory labor and transportation is so well known. In no branch of industry so much as in mining do we demand trustworthy labor and cheap transportation. The miner is not an ordinary laborer.

"His work can not be quickly taught him; he must be skilled. He must understand his art, but first of all he must be able and willing to work. The labor problem as applied to mining means to me that we must open and develop our mines with the best men that money can procure; our first work here must be above reproach in order to establish confidence in this industry.

"The future of the Filipino laborer as a miner can not now be told. He has been generally unsatisfactory in the little beginnings that have been made, but it must be admitted in his behalf that he has not yet seen a modern mine, and his pride and ambition have not yet been aroused in this direction. I have no doubt that in a few years, when we have opened and developed large mines, that we can interest a certain element of the natives in this work and that they may be gradually brought to do good work.

"The Benguet and Bontoc Igorrotes have already won a favorable reputation as surface laborers, and it seems likely that with education in the difficult and dangerous business of mining they may soon establish a demand for their labor underground. Miners must be trained to their work, however, to a degree not required in ordinary labor above ground.

"Whatever labor can be utilized at the first, it would seem that the foremen and bosses should be the best American or European miners that can be secured. Mining should be well started here to overcome its more serious offsets of the past."

The problems of extraction and treatment of the ores are not nearly so serious as the problem of transportation. There is but one railroad in the Philippines and that runs from Manila to Dagupan, on the island of Luzon. All other transportation is by water or carabao carts. Lately a pest has killed 90 per cent of the carabao, and agriculture, which is also dependent on the carabao, has suffered fearfully.

The roads of the interior and mountainous districts are bad, or worse than bad, and the only feasible plan is to get to a waterway or the sea by the shortest route possible. Good highways and strong bridges are lacking in almost every district. Doubtless these now almost insuperable difficulties will be overcome by American energy, but at present the outlook is not bright for the shipments of ore.

The war is over and work can be done anywhere. Of course, there is considerable brigandage in the out-of-the-way places, but this is being put down with a firm hand by the constabulary—the provincial police—and must cease altogether within a few months. It is safe to say miners can work anywhere without fear of losing their lives, when in respectable numbers, and conditions are improving daily.

Hiram McCaskey, the mining engineer, who is an authority on the subject, says of the present mining law of the Philippines:

"We have now been given a mining law assuring the right to prospect and to secure patents to claims. This law may not have met with the unqualified approval of many of our best American mining men in these islands. The two most serious objections to it may be briefly mentioned. Section 33 of the law provides 'That no holder shall be entitled to hold in his, its, or their own name, or in the name of any other person, corporation or association more than one mineral claim upon the same vein or lode.'

"This certainly prevents wholesale locations, as it was intended to do; it will probably very largely prevent worthless locations also, and to this extent is most commendable. The prospector on the other hand, who has really discovered a valuable lode, is prohibited from enjoying more than 1,000 feet of it, and he may not, therefore, sell to his purchaser such a group as he would wish.

"The mine industry, as a whole, need not suffer by the operation of this clause, however, because the attorney-general for the Philippine Islands has handed down the opinion that there is nothing to prevent a purchaser from buying and holding several adjoining patented claims upon the same vein or lode. Therefore, if locators cover a valuable deposit and offer satisfactory prices individually for their respective claims there is nothing to prevent a company from mining on a great scale and upon an economic basis, and therefore the industry is not by any means necessarily foredoomed.

"The second feature of the law, to which objection is so often and so strenuously made by those accustomed to the distinctively American practice, is the substitution of the 'side-line location' for the 'apex law.' Mining in the Eastern States of America, in Mexico, British Columbia, and in Europe is done under the law of vertical side lines; mining in the Western States only is characterized by the 'exclusive right of possession and enjoyment of all the surface included within the lines of their locations and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations.'

"It would seem that discoverers and locators are again injured in their rights as contrasted with Western American practice. Those mining men who have studied the history of the apex law, however, and those who know only too well the uncertainties, misunderstandings, and quarrels that arise from its operations, and the mines that have become unproductive because of the cost of the flood of litigation arising from it, or of mines that have been compelled to close down because of its unfortunate workings alone, to these the definiteness and certainty and freedom from expensive lawsuits assured by the present law will come as a great relief."

AUSTRALASIA.

AUSTRALIA.

GOLD.

In 1902 Australasia produced 3,946,375 fine ounces of gold, of the value of $81,578,811. These figures are based upon the report of the department of mines of Western Australia and on returns received from United States consuls, which were derived from official data. Between the total given above and that in the report of Western Australia, there is a slight discrepancy—about 68 ounces. As no statement is made of the gross ounces produced by Tasmania, it is impossible to give the average fineness of the entire yield; but that of all the other colonies was 0.853.

The output of 1902 was 227,295 fine ounces, or $4,698,605 in excess of that of 1901—a gain of 6.1+ per cent.

The appended table gives the product by colonies:

Colony.	Crude ounces.	Fine ounces.	Value in United States money.
West Australia	2,177,441	1,871,037	$38,677,767
Queensland	860,453	640,463	13,239,545
Victoria	777,738	720,853	14,901,354
New South Wales	190,317	161,255	3,333,437
Tasmania		70,966	1,466,997
South Australia	28,212	22,395	462,946
New Zealand	508,045	459,406	9,496,765
Total		3,946,375	81,578,811

SILVER.

Owing to the fact that a large proportion of the silver produced in Australia is exported in the form of ore and silver-lead, it has always been exceedingly difficult to estimate the amount of the product.

Western Australia and Victoria produce no silver.

Queensland, according to the report of the under secretary of mines for 1902, yielded 644,070 fine ounces; this Bureau estimates the output of New South Wales for the year under discussion at 6,000,000 fine ounces and that of Tasmania at 754,717 fine ounces. Having received no data for South Australia and New Zealand for 1902 the estimates for 1901, which were respectively, 97,870 and 529,290 fine ounces are repeated.

These figures are exhibited in tabular form below, the value being calculated at 53 cents per ounce, the average price during 1903:

Colony.	Ounces.	Commercial value.
Queensland	644, 070	$341, 357
New South Wales	6, 000, 000	3, 180, 000
Tasmania	754, 717	400, 000
South Australia	97, 870	51, 871
New Zealand	529, 290	280, 524
Total	8, 025, 947	4, 253, 752

WESTERN AUSTRALIA.

According to the report of the department of mines of western Australia for 1902, that colony during the calendar year 1902 produced 2,177,441.52 crude ounces, or 1,871,037 fine ounces of gold, valued at £7,947,662, or $38,677,297. This was the greatest output in the history of the colony, being a gain over the preceding year's production of 167,620 fine ounces, or 9.8 per cent.

Following is a statement of the gold production of western Australia from 1886 to 1902, inclusive:

Year.	Gross weight.	Fine contents.	Value.		
	Ounces.	*Ounces.*	£	*s.*	*d.*
1886	302	270. 17	1, 147	12	0
1887	4, 873	4, 359. 37	18, 517	8	0
1888	3, 493	3, 124. 82	13, 273	8	0
1889	15, 492. 50	13, 859. 52	58, 871	10	0
1890	22, 806. 31	20, 402. 42	86, 663	19	7
1891	30, 311. 07	27, 116. 14	115, 182	1	4
1892	59, 548. 31	53, 271. 65	226, 283	11	7
1893	110, 890. 91	99, 202. 50	421, 385	9	2
1894	207, 131. 31	185, 298. 73	787, 098	19	6
1895	231, 512. 69	207, 110. 20	879, 748	4	5
1896	281, 265. 33	251, 618. 69	1, 068, 808	5	1
1897	674, 993. 85	603, 846. 44	2, 564, 976	12	7
1898	1, 050, 183. 60	939, 489. 49	3, 990, 697	13	7
1899	1, 643, 876. 72	1, 470, 604. 66	6, 246, 731	10	9
1900	1, 580, 950. 18	1, 414, 310. 86	6, 007, 610	13	8
1901	1, 879, 390. 51	1, 703, 416. 52	7, 235, 653	9	3
1902	2, 177, 441. 52	1, 871, 037. 35	7, 947, 661	10	11
Total	9, 974, 462. 81	8, 868, 339. 53	37, 670, 311	19	5

Western Australia's production of silver is so slight as to be a negligible quantity in the estimate of the world's output.

QUEENSLAND.

According to the report of the undersecretary for mines of Queensland, that colony, in 1902, produced 860,453 crude, or 640,463 fine ounces of gold, valued at £2,720,639, or $13,239,545, an increase, when compared with the output of 1901, of 42,081 fine ounces, or 7 per cent. There was a marked increase in the fineness, it having averaged 0.744 in 1902 as against 0.716 the preceding year.

Of the total of 860,453 crude ounces of gold produced in 1902, about 1.89 per cent, or 16,229 ounces were obtained from alluvial deposits and the balance, 844,224 ounces, from quartz lodes.

The silver product of the colony is not great, but the yield for 1902 was considerably in excess of that of 1901, it having been valued at £70,145, or $341,360, equivalent, at 53 cents per ounce, to 644,070 fine ounces against 504,659, in 1901, an increase of 139,411 ounces, or 27.6 per cent.

Queensland.

[From the annual report of the undersecretary for mines for the year 1902.]

GOLD.

The gold yield, although less than that of two years ago, is the largest from stone raised and reduced during any one year. The former greater yield of 1900 was swelled by the very large contribution of bullion recovered from the heaps of old tailings that are now fast disappearing. But a casual increment from this source, however welcome, can not be accepted as any criterion of the position and prospects of our mines, and last year may, I think, fairly claim to be accounted the superlative year of gold mining in this state. It was certainly the most profitable, if the dividends paid are a test, and the superiority would have been more striking had not adverse seasons rendered continuous operations on many of our fields difficult or impossible.

SILVER.

The Silver Spur Mine at Texas, in the Stanthorpe district, is the only mine where silver so predominates as to entitle it to be termed distinctively a silver mine. In nearly all other instances the silver produced during the year may be regarded as a by-product of gold and copper mines. At the Silver Spur operations were largely directed to opening out the large ore body met with at the 300-foot level, bulk assays from which returned considerably over 100 ounces per ton.

During the year 4,344 tons of ore were raised, and from 3,181 tons smelted at the company's works were produced 149 tons of matte, containing 77,399 ounces of silver, 111 ounces of gold, 44.25 tons of copper, and 50 tons of lead. The necessary fluxes, 176 tons of limestone, and 4 tons of ironstone were obtained in the neighborhood. This mine has been very successful in the past and appears to have a promising future unless silver falls beneath its present value.

In the absence of any sign from the Queensland Silver Lead Mines (Limited) with respect to the construction of the Albert River, Lilydale and Burketown Tramway, no special activity could be heped for in the Burketown field.

The company have, however, been steadily developing their properties, particularly the Silver King, which continues to disclose large bodies of ore, and the mines are now being examined by Mr. Reginald Murray, the late government geologist of Victoria, on whose report the future operations of the company will largely depend.

VICTORIA.

In answer to this Bureau's interrogatories, Mr. John P. Bray, United States consul-general at Melbourne, states that the colony of Victoria, in 1902, produced 720,866 fine ounces of gold, valued at £3,062,028, or $14,901,359, which would represent 720,853 fine ounces, or 13 ounces less than the reported amount. The yield, therefore, when compared with the output of 1901, shows a decrease of 9,600 ounces, or $198,445. Victoria produces no silver.

NEW SOUTH WALES.

The report of the department of mines of western Australia places the gold product of New South Wales for 1902 at 190,317 crude, or 161,255 fine ounces, which would be worth $3,333,437. As compared with the yield of 1901 there was a decrease of 55,633 fine ounces.

New South Wales is the greatest silver producer in the Australian commonwealth, and most of the silver extracted in that colony is derived from the mines of the Broken Hill Proprietary Company. According to the report of that company for the half year ending May 31, 1903, its output of silver for the fiscal year was 5,217,387 fine ounces. It is assumed that this amount also represents the product for the calendar year.

According to a report received from Mr. H. V. P. Wollaston, comptroller-general of the commonwealth of Australia, New South Wales, in 1902, exported silver-lead ore, silver ore, concentrates, bullion, etc., the product of the colony, to the value of £1,442,727, or $7,021,031 in United States money.

The annual report of the department of mines of New South Wales for 1901 (the latest received by this Bureau) states that the gross value of the silver and lead product of the Broken Hill mines in that year was £2,564,758, and that the value of the silver was estimated at £906,879, or approximately three-eighths of the whole. Assuming that this ratio remained the same in 1902 the export figures would indicate, after an allowance is made for the fine silver exported, a yield of approximately 6,000,000 fine ounces, of the commercial value of $3,180,000. In 1900 the exports of silver, silver lead, ore, etc., from New South Wales were valued at £2,604,117, and in 1901 at £1,854,463. There has been, therefore, a marked decrease in the yield.

BROKEN HILL PROPRIETARY.

[From The Statist, London, September 19, 1903.]

Date.	Ore treated.	Metal produced.		Price of silver per ounce.		Price of lead per ton.		
		Lead.	Fine silver.					
Half year ended—	*Tons.*	*Tons.*	*Ounces.*	*s.*	*d.*	*£*	*s.*	*d.*
November 30, 1899	206,193	18,240	2,502,463	2	$5\frac{1}{2}$	17	2	6
May 31, 1900	232,487	16,007	2,175,422	2	$5\frac{13}{16}$	16	17	6
November 30, 1900	293,451	21,855	2,780,937	2	$6\frac{1}{16}$	16	16	3
May 31, 1901	296,389	27,869	3,009,164	2	$5\frac{9}{16}$	12	5	0
November 30, 1901	305,628	30,457	2,683,946	2	$3\frac{1}{2}$	11	0	0
May 31, 1902	308,878	32,289	2,554,169	2	$1\frac{1}{16}$	11	5	0
November 30, 1902	334,709	33,522	2,798,020	1	$11\frac{7}{16}$	10	12	6
May 31, 1903	289,263	32,029	2,419,367	2	$2\frac{9}{32}$	11	7	6

TASMANIA.

Mr. A. G. Webster, United States counsel at Hobart, Tasmania, replying to this Bureau's interrogatories, states that the colony in 1902 produced 2,207 kilograms of gold, valued at $1,467,605. The latter figure would, however, indicate a slightly larger yield, and insomuch as the London Board of Trade Journal of April 30, 1903, basing its statement upon official returns, places the gold output of Tasmania for 1902 at 70,996 fine ounces, which would be worth $1,467,617, an amount which practically agrees with the consul's valuation, these figures are assumed to represent Tasmania's gold production for 1902.

The yield for 1901 having been 69,491 fine ounces, there was a gain the following year of 1,505 fine ounces, or 2.17+ per cent.

During the same year the silver mines produced 41,832 metric tons of silver-lead, valued at $1,065,101, while the exports of silver-lead are said to have amounted to 25,938 tons, of the value of $1,883,456.

Mines and Quarries for 1901 states that Tasmania in the year 1901–2 produced 32,883 tons of silver-lead ore, valued at £191,238 or $930,660, with the remark "estimated to contain 3,233,495 ounces of fine silver on the assumption that 98⅓ ounces are contained in 1 ton of ore." There is, however, an obvious error in this statement; consequently it throws no light on the probable amount of fine silver to the ton of ore.

This Bureau estimates that the silver contained in the silver-lead produced in Tasmania in 1902 was worth $400,000, which, at 53 cents per ounce, would represent 754,717 fine ounces.

AFRICA.

In 1898 Africa yielded over $80,000,000 worth of gold, or about 28 per cent of the world's product; in 1900, owing to the war in the Transvaal, it dropped to a little more than $8,600,000—a loss of 89 per cent. The product for the calendar year 1901 was $9,087,985, a slight increase over the output of the preceding year.

In 1902 the yield was valued at $39,023,725, which is about 50 per cent of what may be regarded as the normal yield of Africa.

The following table shows whence the output has been derived since 1889:

Year.	Transvaal.		West Coast.		French Colonies.[a]		Rhodesia.[b]		Total.	
	Weight.	Value.	Weight.	Value.	Weight.	Value.	Weight.	Value.	Weight.	Value.
	Kilos.		*Kilos.*		*Kilos.*		*Kilos.*		*Kilos.*	
1889	11,719	$7,788,372	1,270	$844,262	261	$173,461	(c)	....	13,250	$8,806,095
1890	15,706	10,438,356	1,062	705,705	261	173,461	(c)	....	17,029	11,317,522
1891	22,398	14,885,639	1,289	856,730	261	173,461	(c)	....	23,948	15,915,830
1892	34,938	23,220,108	1,528	1,011,924	[d]261	173,461	(c)	....	36,722	24,405,493
1893	42,573	28,293,831	977	649,695	261	173,461	(c)	....	43,811	29,116,987
1894	59,730	39,696,330	865	574,653	261	173,461	(c)	....	60,856	40,444,441
1895	66,045	43,893,300	995	661,630	261	173,461	(c)	....	67,301	44,728,391
1896	65,874	43,779,669	945	627,938	261	173,461	(c)	....	67,080	44,581,068
1897	86,720	57,633,861	751	499,311	640	425,510	(c)	....	88,111	58,558,682
1898	119,190	79,213,953	518	343,928	189	125,987	669	$444,617	120,566	80,128,485
1899	107,410	71,384,561	422	280,185	344	228,512	1,700	1,129,773	109,876	73,023,031
1900	9,215	6,124,226	326	216,873	1,115	741,029	2,392	1,589,815	13,048	8,671,943
1901	8,026	5,333,994	216	143,813	958	636,700	4,476	2,974,943	13,676	9,089,450
1902	52,514	34,901,140	....	7,048	1,127	748,976	5,065	3,366,561	58,716	39,023,725

[a] Includes Madagascar, Algeria, and the French Sudan.

[b] Includes Mozambique, Cape Colony, and Natal for all years except 1901, which does not include product of Mozambique or Natal.

[c] Previous to 1898 Rhodesia and Mozambique together produced 289 kilograms, fine, included in the Transvaal returns.

[d] Previous to 1897 the only figures obtainable were those for 1892—Madagascar only.

TRANSVAAL.

The London Statist of May 16, 1903, places the gold production of the Rand for 1902 at 1,690,098 fine ounces, of the value of £7,173,973, or $34,901,140; this valuation would, however, represent only 1,688,343 fine ounces, which is accordingly taken as the production of that country for 1902.

The Statist adds that there were at work on the Rand at the end of 1902, 2,845 stamps, in contrast with 653 at the end of 1901, and 5,970 in August, 1899.

The London Mining World and Engineering Record of July 18, 1903, places the product of the Transvaal in 1902 at 1,691,519 ounces, but does not specify its fineness. This figure closely agrees with that quoted from the Statist. The average fineness of the yield was, approximately, 0.872.

According to the yearly report of the Transvaal mines department, that country in the statistical year ending June 30, 1902, produced 899,999.196 ounces of gold worth £3,788,968, or $18,439,013, equivalent to 891,987 fine ounces. To produce 1 ounce of fine gold 2.457 tons of rock were crushed. During the year there was a constant monthly increase.

As the report covers the statistical year ending June 30, and as the mining industry in that country is at present, owing to the interruption occasioned by the Boer war, developing in an abnormal manner, the figures for the first six months of the year are of no value in endeavoring to form an estimate for the entire year.

The appended table, showing the production of gold in the Transvaal, in fine ounces, from 1884 to 1901, inclusive, is quoted from the same report, which confirms this Bureau's estimate for 1901:

Year.	Fine ounces.	Year.	Fine ounces.
1884	2,376	1893	1,290,218
1885	1,414	1894	1,805,000
1886	8,171	1895	2,017,443
1887	39,880	1896	2,025,510
1888	227,749	1897	2,743,518
1889	350,909	1898	3,823,367
1890	440,152	1899	3,637,713
1891	688,439	1900	348,761
1892	1,069,058	1901	258,032

RHODESIA.

According to the monthly reports of the Rhodesia Chamber of Mines, Rhodesia, comprising Matabeleland and Mashonaland, produced during the calendar year 1902, 194,169 ounces 6.23 dwt. of crude gold. This Bureau has returns of the values of the yield for only nine months, according to which the fineness averaged 0.8375; assuming that this fineness remained the same for the entire twelve months, the product for the year would be 162,617 fine ounces, of the value of $3,361,592.

There was, therefore, a gain as compared with the yield of 1901, of 18,775 fine ounces, worth $388,114, or, in other words, of 13+ cent.

Following is a statement of the product of Rhodesia from 1898:

Year.	Weight.		Value.
	Crude ounces.	Fine ounces.	
1898 (prior to Sept. 1)	6,470	5,409	$104,202
1898 (Sept. 1 to Dec. 1)	18,085	15,119	312,537
1899	65,303	54,589	1,128,444
1900	91,850	76,779	1,587,168
1901	172,060	143,842	2,973,478
1902	194,169	162,617	3,361,592
Total	547,937	458,355	9,467,421

[From The Gold Mines of the World, Curle, second edition, 1902.]

The typical Rhodesian mine is a narrow reef, or perhaps two reefs, with two or three ore chutes, which in individual length rarely average 300 feet. * * * It is surprising the number of gold-bearing reefs that are known in Rhodesia. They were easily located because of the native workings on them, and a great number have been or are being exploited in depth. The extent of these ancient workings along the surface not only pointed out the direction of a reef but, where they were deep and persistent over a long distance, indicated that here probably was located a strong ore chute. * * *

There is in the aggregate of all these reefs a very great deal of gold. It is quite correct to say that Rhodesia is full of gold, but between gold and gold in a payable condition there is all the difference in the world.

CAPE COLONY.

Answering this Bureau's interrogatories, Mr. William R. Brigham, United States consul-general at Cape Town, states that Cape Colony, in 1902, produced 806.358 grams of gold, valued at £103 13s. 6¼d., or $504.53, equivalent to 24 fine ounces. No silver is produced in the Colony.

The Orange River Colony produced neither gold nor silver in 1902.

MADAGASCAR.

Replying to this Bureau's interrogatories, Mr. Horace Porter, United States ambassador to France, states that Madagascar, in 1901, produced 1,045 kilograms of gold, valued at 2,821,500 francs, or $544,549, which would indicate that the gold was 0.784 fine. The fine contents would therefore be 26,342 ounces. According to United States Consular Report No. 273 (June, 1903), the exportation of gold dust from Tavatave, in 1902, amounted to $748,976, equivalent to 36,232 fine ounces, which is assumed to represent Madagascar's production for that year.

GOLD COAST MINING IN 1901.

[From the Mining Journal, Railway and Commercial Gazette, London, January 3, 1903.]

According to the recently issued colonial office report gold is widely diffused throughout the colony, Ashanti, and the northern territories, in quartz formation, and alluvial deposits, while in Wassau there is good conglomerate (banket). The lack of good roads and means of transporting heavy machinery has proved an obstacle to successful mining on a large scale in the past, but the energy latterly displayed in mining enterprise is resulting in widespread improvement to the road system, and the Sekondi-Kumasi Railway, in course of construction, overcomes the difficulty of transport to the Wassau district.

The following table shows the amount of gold exported in 1901 and in each of the four previous years:

Year.	Quantity.	Value.
	Ounces.	
1897	23,544	£84,797
1898	17,733	63,838
1899	14,249	51,300
1900	10,557	38,007
1901	6,162	22,187

During the year 2,825 concessions were filed in the colony, 41 orders for survey were issued, and 5 prospecting licenses were converted into mining licenses. The number of surveyors' licenses issued was 44.

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NOTES ON THE IVORY COAST, WEST AFRICA.

[By S. J. TRUSCOTT and N. SAMWELL. From the Mining Journal, Railway and Commercial Gazette, London, January 10, 1903.]

* * * * * * *

OCCURRENCE OF THE GOLD.

There are three occurrences of gold, which are as follows:

1. As reef gold, in quartz reefs.
2. As detrital gold, in the fragmentary formation.
3. As alluvial gold, in the present stream beds.

QUARTZ REEFS AND REEF GOLD.

There is no doubt that this is the primary source of the gold in the other two occurrences. There are quartz reefs right throughout the basement rock, and where that rock is exposed the outcrops of reefs occur. It follows from this that most of the reefs which have been found occur in the Sanwi, because in that district the basement rock is not so covered up. The most noticeable feature about the reefs was the large blocks of quartz which came from them. It appeared, however, that some of the reefs, and most of those examined, were more in the nature of blows, because their large thickness was not maintained for any great length; it sometimes happens that, on a hillside, a quartz outcrop could be seen striking toward a stream close by, which, however, it never reached. This uncertain character was especially noticeable where the basement rock was holocrystalline. It is stated that the general strike of reefs in this country and in the neighborhood of Gold Coast Colony is north of east and south of west, parallel to assumed axes of dynamic movement, and it would appear that most of the reefs do thus conform to that general strike. The quartz generally all over the country is white and opaque, and with a low percentage of mineral in it. Fractures stained with iron oxide and cavities with colored interiors do occur, but only to such an extent that the whiteness of the quartz is enhanced and not sullied. Iron pyrites, copper pyrites, and galena have been noticed in small amounts, and some samples showed the clayey results of an original feldspathic content; other samples, again, showed many small places of a light-colored mica, and, contrary to expectations, some of these latter gave good colors of gold in the pan.

Although several quartz reefs containing gold have outcrops which have long been known, the natives have worked very little upon them, and, in comparison with native workings in other countries, it may be said that the natives in this country did not work reefs; the work they did upon them was in the nature of trial, which was not followed up. The largest amount of work done by them upon a reef was near Koffikourou, in the Lower Sanwi, where two shafts, each about 40 feet deep, were sunk upon a body of quartz. At Akrizi, Koffikourou, and Dadieso, in the Sanwi, quartz has been ground down by natives upon blocks of quartz diorite, using a small stone as a grinder, but the amount so ground was limited to the small amount of quartz which had been mined at the respective places. It must be assumed that the natives did not find the reefs good enough to continue working upon; the importance of this can be appreciated from the fact that upon those properties of the neighboring Gold Coast Colony which have any promise of success at all there are extensive old workings where the natives mined quartz. The nearest of these to the Ivory Coast is that belonging to the Bibiani Company, which is situated about 55 miles inside of the British frontier, and roughly on the same parallel at Zaranou. In dealing later with the occurrence of gold in the present stream beds, mention will be made of the work which natives have done in more than one place in detritus on low ground for gold which has evidently come from reefs on neighboring high ground.

DETRITAL GOLD IN THE FRAGMENTARY FORMATION.

This is the immediate source of most of the gold which has been won in this country. Gold has been found all over the country, and so, in one form or another, has the fragmentary formation. It is evident, however, by the distribution of the gold in greater and lesser quantity, that the greater quantity was always found in those places where the lower detrital bed was exposed and the lesser quantity in other places. At Afiénou, in the Lower Sanwi; at Babouin, near Zaranou, and at other places in the Assikasso district, old workings were most in evidence and at all of those places the lower detrital bed was exposed. A small amount of washing is still being done at those places. At Beboum the occurrences could be well seen. There were many pits, about 2 feet in diameter and from 15 to 20 feet in depth, which had been sunk through the lower deposit to work out the layer which lies upon the basement rock. These pits are enlarged at the bottom and most of them connect up with one another; it is said that they occur in three well-defined lines which run parallel in a northeast and southwest direction and are not far apart. This detrital deposit was here quite red in color and loamy in texture. The fragments of quartz which it contained were generally quite angular, and some of them were large enough for the masonary of ordinary walling.

In one place it would appear that for a limited extent the natives worked the whole of it as an open cast to a depth of about 12 feet, till it became too much for them, and then they burrowed beneath upon the bottom layer only. The upper ferruginous agglomerate was here represented by a few blocks and much red color. The basement rock was of salt schists, into which in two places tunnels had been driven; but no definite reef was exposed, though in one of them a limited extent of quartz was met with, which gave assays from a few pennyweights up to 30 pennyweights. These workings occur on the right bank of and close up to the River Menzan, and they run parallel with the general direction of that river, in the bed of which there is considerable alluvial gold. The deeper well of the two, mentioned before as having been sunk at the post of Assikasso, was 60 feet deep, and samples which were taken from the top to the bottom showed that gold occurred to a small extent throughout the deposits there exposed. In general the gold which is won is fairly coarse, though there is a good deal of fine gold with it.

Nuggets do occur, but they are of no great size; one weighing 10 pennyweights would be a large one. They are used to make necklaces and bracelets, the average size of those so used being about 3 or 4 pennyweights.

With reference to the ferruginous agglomerate, gold has been found in many pieces of it, and it was especially noticed where the pebbles were round and where the rock was a conglomerate. This would almost point to a connection between the pebbles and the gold and, in spite of large occurrences of such conglomerate which contained no gold, there does still appear to be such a connection. This may be that they are both detrital products from auriferous quartz reefs, and that they are of such a nature that they would be found near the bottom of a detrital deposit, one by reason of its heaviness and the other by reason of its hardness. This ferruginous agglomerate in the solid mass has never been worked by the natives, though it is likely that it has been the source of a portion of the gold which they have won from the stream beds which cut through it.

ALLUVIAL GOLD IN THE PRESENT STREAM BEDS.

Most of the stream beds carry gold, especially those which flow through the lower portion of the fragmentary formation. It is quite possible that the beds of the large streams contain an amount of gold which in other countries better adapted for European residence would be payable. Trials which have been made by panning the sand of such river beds have generally been encouraging. These remarks apply to the Comoe and its tributaries the Menzan and Bahia; to the Tanoe, which in its lower portion forms the boundary between the British and French territories; and in lesser force to the River Bia. There are two occurrences, one at Akrizi and the other near Iaon, where the natives worked the stream beds for the gold which had undoubtedly been shed from reefs now seen outcropping the hills close by.

GENERAL.

With reference to the gold in the fragmentary deposit, the opinion is hazarded that the rounded pebbles and some fine gold come from the breaking down of a banket bed such as there is at Tarkwa, in the neighboring Gold Coast Colony, and that the more angular quartz fragments and the coarser gold have come more directly from quartz reefs. In order to correct any tendency to misapprehension which might arise from the above remark, it must be stated that no banket was noticed in the area traversed, nor any sandstone or clay slate formation with which banket might be associated. This fragmentary formation has a great extension, as both the ferruginous agglomerate and the lower yellow deposit are found farther to the east in the Gold Coast Colony and Ashanti, and farther to the west in the other portion of the Ivory Coast. A. R. Sawyer says in a paper on the Tarkwa Gold Field, read before the Institution of Mining Engineers on September 3, 1901:

"A secondary and quite recent conglomerate and breccia, which has the appearance of an agglomerate in places, overlies these schists unite unconformably, but it is not auriferous. It is highly ferruginous in places."

The same formation has also been noticed to occur at Bondoukou, which is farther to the north, that district and that of Lobi, which is still farther to the north, being reputedly very auriferous. It would appear that the ferruginous cement of the upper layer of the fragmentary formation was a very fluid overflow of a ferro-manganese lava, which took up the upper portion of the then existing detrital deposit, leaving the lower layer intact. Such a solution would demand centers for such an overflow and a very even surface to flow upon. The section which is appended is drawn having the vertical scale 100 times that of the horizontal scale, so that the surface there appears hilly, whereas in reality it is very even, being, with the exception of the hills between Aboisso and Iaou, a gradual ascent toward the interior. The highest point is 275 meters, or about 900 feet above the sea, and this is at the end of the section, about 150 miles in a direct line inland. The extended occurrence and the shallow depth of the fragmentary formation, which is undoubtedly a detrital deposit, would show that at the time of its deposition the surface was very even, so that the condition of an even surface for the flow seems to have been satisfied. With regard to other conditions necessitating centers of outpouring, there is evidence of the existence of a volcanic center near Bafia, and on a map made by a former Government official the position of a crater is marked in that neighborhood. In addition, the breccias before mentioned as occurring near Iaou and Dibi are without much doubt volcanic breccias, and it is probable that near Iaou there is another volcanic center, or rather the continuation of the same one, along a line running about east and west through Iaou and Bafia. This line is suggested by the raised position of the basement rock along it, this being strongly marked by the bars and rapids in all the rivers which come down to the coast in this part of the country. The rivers Tanoe, Bia, and Comoe are all navigable by steam launches up to points situated about the same distance from the coast, where in a hilly country rapids are formed by the outcropping of the basement; farther upstream their courses in a more even country are smooth again. Leaving out the question of the origin of the ferruginous matrix of the upper portion, the formation of the fragmentary bed, containing, as it does, many large and many angular fragments, can be best explained by a large advancing tidal action in a relatively very quick time, such as would follow upon dynamic movement; but such a solution confirms at the same time the possibility of the volcanic origin of the ferruginous cement, for the outpouring of lava is closely allied to dynamic movement. If such be then the case, the ferruginous agglomerate and the lower yellow deposit become practically contemporaneous. Where the agglomerate occurs without the lava deposit it was probably the case that the latter was so shallow that it was wholly taken up by the lava. These ideas represent those we are inclined to believe after much consideration.

EGYPTIAN GOLD MINES.

[From the Engineering and Mining Journal, New York, April 11, 1903.]

The following description of the Samut mining area, abstracted from a report recently made by Mr. Fred. J. Donnal, superintendent of the Egypt and Soudan Mining Syndicate, will give a general idea of the conditions encountered in this region:

The physical features of this district are somewhat similar to those of Hamesh. The whole area consists of low rocky hills intersected by numerous water courses; the latter are devoid of trees and vegetation of any kind, the absence of which gives the locality a most deserted and weird appearance.

The geological formation is chiefly dioritic and porphyritic rocks, the western boundary of which, about 3 miles distant from the mine, is marked by the immense belt of zone of Nubian sandstone extending westward to the Nile.

Several veins of quartz of varying thickness and length, and showing unmistakable evidence of diligent and careful prospecting by the ancients, have been discovered within a radius of 4 miles from the principal vein.

On each side of and adjacent to the principal workings a large area is covered with the ruined remains of what undoubtedly were once well-built habitations of the workers. In some cases they form a settlement of considerable magnitude, sufficient to accommodate a large number of men. A short distance southeast of the foregoing are representations of more dwellings scattered along the slope of the hills, singly and in groups of two or three, while in a small wady, about 1 mile farther west, scores of similar huts, single and in blocks, may be be counted along the sides of the wady for a distance of at least 1 mile.

As the latter contain a large number of well-worn rubbing stones it is assumed that the bulk of the ore from the workings was conveyed there to be pulverized, to enable them to extract the gold by washing, or by a process unknown to us, since no such stones, excepting a few hand mills of the circular type lying at the second site, are to be seen at the other sites. Again, about one and a half miles south-southeast of the camp another large ruin (about 260 by 190 feet) and a number of huts within easy distance of it exist. This old settlement is termed by the Arabs a Roman station, which doubtless it was, since it is on the old caravan route from Edfu to Berenice.

The immense number of ruined huts, together with that of the ancient workings, which are more numerous and extensive than those at Hamesh, point to the conclusion that this was once a large and populous mining center.

* * * * * * *

The principal vein at Samut can be traced by ancient workings and outcrops over a length of 3,000 feet. From the point where it is first seen the vein has been worked (northward) almost continuously for the first 1,000 feet in the usual manner, viz, by an open cast along the outcrop. All the excavations, however, are nearly filled to the surface with drifted sand and débris that has fallen from the walls. Several samples were panned from the small dumps of quartz lying near the workings, and from the veins where exposed prior to commencing operations, and give results from a trace to 15 pennyweights of gold per ton. Six samples were also sent to London for assay and yielded from 1 pennyweight to 11 pennyweights of gold per ton. Three of the old workings on this vein have been partially cleared to date.

* * * * * * *

PART IV.

GENERAL STATISTICS.

I.—Deposits and Purchases of Gold and Silver, by Weight,

Description of deposits.	COINAGE MINTS.			ASSAY OFFICES.	
	Philadelphia.	San Francisco.	New Orleans.	New York.	Denver.
GOLD.					
Domestic bullion:	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*
Unrefined	13,299.829	260,139.826	156.651	352,619.353	283,246.208
Refinery bars				340,713.092	587,473.976
Refined		1,481,434.957		1,307,898.939	
Total domestic bullion	13,299,829	1,741,574.783	156.651	2,001,231.384	870,720.184
Domestic coin:					
Mutilated and abraded	2,126.058	408.147	386.767	28,920.071	12.010
Treasury transfers	28,215.100	895.391			
Foreign bullion:					
Unrefined	9,749.919	42,548.556	20,669.799	271,070.989	645.557
Refined abroad				175,706.977	
Foreign coin	235.123	421,845.162	253.269	59,270.811	
Jewelers' bars, old plate, etc	49,398.792	1,701.009	2,702.470	173,154.696	1,429.709
Total deposits	103,024.821	2,208,973.048	24,168.956	2,709,354.928	872,807.460
Redeposits:					
Fine bars	3,124.861		14.071	2,793.862	
Unparted bars	1,141,176.248	629,554.048			143.177
Total redeposits	1,144,301.112	629,554.048	14.071	2,793.862	143.177
Total gold operated upon	1,247,325.933	2,838,527.096	24,183.027	2,712,148.790	872,950.637
SILVER.					
Domestic bullion:					
Unrefined	7,390.73	54,897.88	61.60	186,952.16	100,726.44
Refinery bars				128,113.66	2,744.18
Refined	685,527.32			1,579,313.83	
Total domestic bullion	692,918.05	54,897.88	61.60	1,894,379.65	103,470.62
Domestic coin:					
Mutilated and abraded	2,144.79	129.00	311.66	161.33	
Treasury transfers	1,917,807.65	111,045.26	513,099.80		
Trade dollars	154.21		.86		
Foreign bullion:					
Unrefined	12,874.97	11,221.19	6,475.14	1,108,745.90	254.02
Refined abroad					
Foreign coin	292.01		1,855.35	34,305.33	
Jewelers' bars, old plate, etc	138,924.63	31,735.84	2,971.88	532,010.49	402.71
Total deposits	2,765,116.31	212,029.17	524,776.29	3,569,602.70	104,127.35
Redeposits:					
Fine bars		2,361,998.92	7,126,783.98	45,234.59	
Mint bars					
Standard bars					
Unparted bars	188,688.08	114,067.09	43,421.24		135.87
Total redeposits	188,688.08	2,476,066.01	7,170,205.22	45,234.59	135.87
Total silver operated upon	2,953,804.39	2,688,095.18	7,694,981.51	3,614.837.29	104,263.22

DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1902.

ASSAY OFFICES.							Total.
Carson.	Boise.	Helena.	Charlotte.	St. Louis.	Deadwood.	Seattle.	
Stand. ozs. 12,770.173	*Stand. ozs.* 79,090.957	*Stand. ozs.* 109,053.503	*Stand. ozs.* 10,693.281	*Stand. ozs.* 2,453.830	*Stand. ozs.* 44,646.704	*Stand. ozs.* 160,655.623	*Stand. ozs.* 1,328,825.938
...	...	...	4,556.252	1,713.161	...	2,404.155	936,860.636
...	...	...	...	887.293	...	84,734.416	2,874,955.605
12,770.173	79,090.957	109,053.503	15,249.533	5,054.284	44,646.704	247,794.194	5,140,642.179
...	...	...	4.025	7.107	151,307	...	32,015.492
...	...	...	...	...	...	...	29,110.491
127.681	...	12,559.580	1.242	13.926	...	386,832.413	744,219.662
...	...	...	...	...	...	...	175,706.977
...	...	...	4.424	...	...	4.816	481,613.605
1.254	...	160.759	179.127	1,615.455	...	249.455	230,592,726
12,899.108	79,090.957	121,773.842	15,438.351	6,690.772	44,798.011	634,880.878	6,833,901.132
...	...	...	...	...	...	...	5,932.797
...	...	225.169	...	...	...	54.509	1,771,153.151
...	...	225.169	...	...	...	54.509	1,777,085.948
12,899.108	79,090.957	121,999.011	15,438.351	6,690.772	44,798.011	634,935.387	8,610,987.080
7,368.59	30,084.45	24,948.55	1,389.02	800.11	19,719.61	19,073.66	453,412.80
...	...	...	...	20.53	...	...	130,878.37
...	...	...	...	...	...	...	2,264,841.15
7,368.59	30,084.45	24,948.55	1,389.02	820.64	19,719.61	19,073.66	2,849,132.32
...	...	...	...	...	...	...	2,746.78
...	...	...	...	...	...	...	2,541,952.71
...	...	...	...	...	...	...	155.07
48.79	...	7,814.56	.39	9.18	...	90,819.33	1,238,263.47
...	...	...	...	...	...	...	...
...	...	...	1.78	...	...	...	36,454.47
.27	...	50.44	122.48	382.74	...	73.33	709,674.81
7,417.65	30,084.45	32,813.55	1,513.67	1,212.56	19,719.61	109,966.32	7,378,379.63
...	...	...	...	...	...	...	9,531,017.49
...	...	...	...	...	...	...	...
...	...	295.97	...	...	...	18.34	346,626.59
...	...	295.97	...	...	...	18.34	9,880,644.08
7,417.65	30,084.45	33,109.52	1,513.67	1,212.56	19,719.61	109,984.66	17,259,023.71

II.—Deposits and Purchases of Gold and Silver, by Value,

Description of deposits.	COINAGE MINTS.			ASSAY OFFICES.	
	Philadelphia.	San Francisco.	New Orleans.	New York.	Denver.
GOLD.					
Domestic bullion:					
Unrefined	$247,438.68	$4,839,810.72	$2,914.43	$6,560,360.06	$5,269,696.88
Refinery bars	....	....	....	6,338,848.23	10,929,748.39
Refined	....	27,561,580.59	....	24,333,003.53	....
Total domestic bullion	247,438.68	32,401,391.31	2,914.43	37,232,211.82	16,199,445.27
Domestic coin:					
Mutilated and abraded	39,554.57	7,593.43	7,195.67	538,047.84	223.45
Treasury transfers	524,932.09	16,658.44	....	....	....
Foreign bullion:					
Unrefined	181,393.84	791,601.04	384,554.35	5,043,181.21	12,010.37
Refined abroad	....	....	....	3,268,967.02	....
Foreign coin	4,374.38	7,848,282.08	4,711.92	1,102,712.77	....
Jewelers' bars, old plate, etc	919,047.29	31,646.68	50,278.42	3,221,482.72	26,599.24
Total deposits	1,916,740.85	41,097,172.98	449,654.79	50,406,603.38	16,238,278.33
Redeposits:					
Fine bars	58,137.00	....	261.78	51,978.84	....
Unparted bars	21,231,186.01	11,712,633.48	....	....	2,663.74
Total redeposits	21,289,323.01	11,712,633.48	261.78	51,978.84	2,663.74
Total gold operated upon	23,206,063.86	52,809,806.46	449,916.57	50,458,582.22	16,240,942.07
SILVER.					
Domestic bullion:					
Unrefined	8,600.12	63,881.17	71.68	217,544.32	117,208.96
Refinery bars	....	....	....	149,077.72	3,193.22
Refined	797,704.52	....	....	1,837,747.00	....
Total domestic bullion	806,304.64	63,881.17	71.68	2,204,369.04	120,402.18
Domestic coin:					
Mutilated and abraded	2,495.76	150.11	362.66	187.73	....
Treasury transfers	2,231,630.71	129,216.30	597,061.59	....	....
Trade dollars	179.45	....	1.00	....	....
Foreign bullion:					
Unrefined	14,981.79	13,057.38	7,534.70	1,290,177.05	295.59
Refined abroad	....	....	....	....	....
Foreign coin	339.79	....	2,158.95	39,918.93	....
Jewelers' bars, old plate, etc	161,657.75	40,419.89	3,458.19	619,066.75	468.61
Total deposits	3,217,589.89	246,724.85	610,648.77	4,153,719.50	121,166.38
Redeposits:					
Fine bars	....	2,748,507.84	8,292,984.99	52,636.62	....
Mint bars	....	....	....	....	....
Standard bars	....	....	50,526.53	....	....
Unparted bars	219,564.31	132,732.61	....	....	158.10
Total redeposits	219,564.31	2,881,240.45	8,343,511.52	52,636.62	158.10
Total silver operated upon	3,437,154.20	3,127,965.30	8,954,160.29	4,206,356.12	121,324.48
Total value of gold and silver	26,643,218.06	55,937,771.76	9,404,076.86	54,664,938.34	16,362,266.55

during the Calendar Year ended December 31, 1902.

ASSAY OFFICES.							Total.
Carson.	Boise.	Helena.	Charlotte.	St. Louis.	Deadwood.	Seattle.	
$237,584.61	$1,471,455.32	$2,028,901.87	$198,944.12	$15,652.64	$830,635.40	$2,988,941.82	$24,722,336.55
....	....	....	84,767.47	31,872.76	....	44,728.47	17,429,965.32
....	....	....	....	16,507.77	....	1,576,454.24	53,487,546.13
237,584.61	1,471,455.32	2,028,901.87	283,711.59	94,033.17	830,635.40	4,610,124.53	95,639,848.00
....	....	....	74.90	132.14	2,815.00	....	595,637.00
....	....	....	....	....	....	....	541,590.53
2,375.46	....	233,666.59	23.10	259.08	....	7,196,880.14	13,845,945.18
....	....	....	....	....		....	3,268,967.02
....	....	....	82.31	....	....	89.60	8,960,253.06
23.36	....	2,990.87	3,332.61	30,054.02	....	4,641.02	4,290,096.23
239,983.43	1,471,455.32	2,265,559.33	287,224.51	124,478.41	833,450.40	11,811,735.29	127,142,337.02
....	....	....	....	....	....	....	110,377.62
....	....	4,189.20	....	....	....	1,014.12	32,951,686.55
....	....	4,189.20	....	....	....	1,014.12	33,062,064.17
239,983.43	1,471,455.32	2,269,748.53	287,224.51	124,478.41	833,450.40	11,812,749.41	160,204,401.19
8,574.35	35,007.36	29,031.04	1,616.31	931.00	22,946.45	22,194.80	527,607.56
....	....	....	....	23.88	....	....	152,294.82
....	....	....	....	....	....	....	2,635,451.52
8,574.35	35,007.36	29,031.04	1,616.31	954.88	22,946.45	22,194.80	3,315,353.90
....	....	....	....	....	....	....	3,196.26
....	....	....	....	....	....	....	2,957,908.60
....	....	....	....	....	....	....	180.45
56.77	....	9,093.31	.45	10.68	....	105,680.67	1,440,888.39
....	....	....	....	....	....	....	....
....	....	....	2.08	....	....	....	42,419.75
.32	....	58.69	142.52	445.35	....	85.33	825,803.40
8,631.44	35,007.36	38,183.04	1,761.36	1,410.91	22,946.45	127,960.80	8,585,750.75
....	....	....	....	....	....	....	11,094,129.45
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	50,526.53
....	....	344.40	....	....	....	21.34	352,820.76
....	....	344.40	....	....	....	21.34	11,497,476.74
8,631.44	35,007.36	38,527.44	1,761.36	1,410.91	22,946.45	127,982.14	20,083,227.49
248,614.87	1,506,462.68	2,308,275.97	288,985.87	125,889.32	856,396.85	11,940,731.55	180,287,628.68

III.—Deposits of Unrefined Gold of Domestic Production with the States and 0.992) and Refined Bullion (Fineness 0.992 and over) of Domestic Bullion not

	Source of deposits.	Coinage mints.			Assay offices.	
		Philadelphia.	San Francisco.	New Orleans.	New York.	Denver.
		Stand. ozs.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*
1	Alabama	12,904		84,181		
2	Alaska	1,024,646	9,092,336	13,226	369,751	231,788
3	Arizona	580,539	21,127,559	15,758	112,522	28,611,380
4	California	304,782	206,330,477		8,147,574	83,501
5	Colorado	62,758	1,974,711	43,486	252,263	243,644,324
6	Georgia	1,011,194			25,012	
7	Idaho	693,535	622,282		34,782	343,141
8	Kansas	4,865				
9	Maryland	134,605				
10	Michigan	127			3,117	
11	Minnesota	7,121				
12	Montana	7,910,729	157,825		12,449,483	31,197
13	Nevada	35,064	13,702,329		6,134,997	
14	New Mexico	134,291	128,379		320,947	5,841,178
15	North Carolina	240,003			132,509	
16	Oklahoma					
17	Oregon	163,465	6,363,138			11,542
18	South Carolina					
19	South Dakota	363,957			234,884,799	10,946
20	Tennessee					
21	Utah		232,700		89,611,305	4,104,581
22	Vermont				9,998	
23	Virginia	141,435				
24	Washington	15,538	397,442			30,049
25	Wyoming	46,552				302,581
26	Other States	398,614	10,648			
27	Porto Rico				130,294	
28	Philippine Islands	13,105				
	Total unrefined	13,299,829	260,139,826	156,651	352,619,353	283,246,208
	Refinery bars (fineness below 0.992)				340,713,092	587,473,976
	Refined bullion (fineness 0.992 and over)		1,481,434,957		1,307,898,939	
	Total gold	13,299,829	1,741,574,783	156,651	2,001,231,384	870,720,184

TERRITORIES PRODUCING THE SAME, AND ALSO OF REFINED BARS (FINENESS BELOW DISTRIBUTED, BY WEIGHT, DURING THE CALENDAR YEAR ENDED DECEMBER 31, 1902.

ASSAY OFFICES.							Total.	
Carson.	Boise.	Helena.	Charlotte.	St. Louis.	Deadwood.	Seattle.		
Stand. ozs.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	
....	....	....	34,790	....	....	....	131,875	1
....	....	20,597	....	49,983	....	152,609,887	163,412,214	2
....	....	....	....	68,445	....	....	50,516,203	3
1,402,408	....	....	....	....	....	18,285	216,287,027	4
....	....	....	2,998	1,070,020	....	....	247,050,560	5
....	....	....	4,205,497	13,898	....	....	5,255,601	6
....	42,727,803	8,920,385	....	....	....	807,509	54,149,437	7
....	....	....	....	....	....	....	4,865	8
....	....	....	....	....	....	....	134,605	9
....	....	....	....	....	....	....	3,244	10
....	....	....	....	....	....	....	7,121	11
....	7,057,728	95,859,912	....	1,215,928	....	2,803,178	127,485,980	12
11,367,765	....	3,446,153	....	....	....	....	34,686,308	13
....	....	....	....	18,247	....	....	6,443,042	14
....	....	....	3,228,390	....	....	....	3,600,902	15
....	....	....	....	9,764	....	....	9,764	16
....	29,137,986	97,631	....	....	....	181,291	35,955,053	17
....	....	....	3,217,229	....	....	....	3,217,229	18
....	....	....	....	....	44,646,704	....	279,906,406	19
....	....	....	3,952	....	....	....	3,952	20
....	10,449	....	....	....	....	....	93,959,035	21
....	....	....	....	....	....	....	9,998	22
....	....	....	425	....	....	....	141,860	23
....	156,991	708,825	....	....	....	4,235,473	5,544,318	24
....	....	....	....	....	....	....	349,133	25
....	....	....	....	7,545	....	....	416,807	26
....	....	....	....	....	....	....	130,294	27
....	....	....	....	....	....	....	13,105	28
12,770,173	79,090,957	109,053,503	10,693,281	2,453,830	44,646,704	160,655,623	1,328,825,938	
....	....	....	4,556,252	1,713,161	....	2,404,155	936,860,636	
....	....	....	....	887,293	....	84,734,416	2,874,955,605	
12,770,173	79,090,957	109,053,503	15,249,533	5,054,284	44,646,704	247,794,194	5,140,642,179	

IV.—Deposits of Unrefined Gold of Domestic Production, with the States Below 0.992) and Refined Bullion (Fineness 0.992 and over) of Domestic December 31, 1902.

	Source of deposits.	COINAGE MINTS.			ASSAY OFFICES.	
		Philadelphia.	San Francisco.	New Orleans.	New York.	Denver.
1	Alabama	$240.08		$1,566.16		
2	Alaska	19,063.18	$169,159.74	246.06	$6,879.09	$4,312.33
3	Arizona	10,800.73	393,070.87	293.17	2,093.43	532,304.74
4	California	5,670.36	3,838,706.55		151,582.77	1,553.51
5	Colorado	1,167.59	36,738.81	809.04	4,693.27	4,532,917.66
6	Georgia	18,812.91			465.34	
7	Idaho	12,902.98	11,577.34		647.11	6,384.02
8	Kansas	90.51				
9	Maryland	2,504.28				
10	Michigan	2.36			57.99	
11	Minnesota	132.48				
12	Montana	147,176.35	2,936.28		231,618.29	580.41
13	Nevada	652.35	254,927.05		114,139.48	
14	New Mexico	2,498.44	2,388.45		5,971.11	108,673.08
15	North Carolina	4,465.17			2,465.28	
16	Oklahoma					
17	Oregon	3,041.21	118,383.96			214.73
18	South Carolina					
19	South Dakota	6,771.29			4,369,949.75	203.65
20	Tennessee					
21	Utah		4,329.30		1,667,187.07	76,364.29
22	Vermont				186.01	
23	Virginia	2,631.35				
24	Washington	289.08	7,394.27			559.05
25	Wyoming	866.08				5,629.41
26	Other States	7,416.08	198.10			
27	Porto Rico				2,424.07	
28	Philippine Islands	243.82				
	Total unrefined	247,438.68	4,839,810.72	2,914.43	6,560,360.06	5,269,696.88
	Refinery bars (fineness below 0.992)				6,338,848.23	10,929,748.39
	Refined bullion (fineness 0.992 and over)		27,561,580.59		24,333,003.53	
	Total gold	247,438.68	32,401,391.31	2,914.43	37.232,211.82	16,199,445.27

AND TERRITORIES PRODUCING THE SAME, AND ALSO OF REFINED BARS (FINENESS BULLION NOT DISTRIBUTED, BY VALUE, DURING THE CALENDAR YEAR ENDED

ASSAY OFFICES.							Total.	
Carson.	Boise.	Helena.	Charlotte.	St. Louis.	Deadwood.	Seattle.		
			$647.26				$2,453.50	1
		$383.19		$929.91		$2,839,253.71	3,040,227.21	2
				1,273.39			939,836.33	3
$26,091.31						340.19	4,023,944.69	4
			55.75	19,907.34			4,596,289.46	5
			78,241.42	258.56			97,778.23	6
	$794,934.37	165,960.55				15,023.42	1,007,429.79	7
							90.51	8
							2,504.28	9
							60.35	10
							132.48	11
	131,305.82	1,783,439.89		22,621.91		52,152.15	2,371,831.10	12
211,493.30		64,114.45					645,326.63	13
				339.47			119,870.55	14
			60,062.96				66,993.41	15
				181.69			181.69	16
	542,100.55	1,816.39				3,372.85	668,929.69	17
			59,855.33				59,855.33	18
					830,635.40		5,207,560.09	19
			73.50				73.50	20
	194.15						1,748,074.81	21
							186.01	22
			7.90				2,639.25	23
	2,920.43	13,187.40				78,799.50	103,149.73	24
							6,495.49	25
				140.37			7,754.55	26
							2,424.07	27
							243.82	28
237,584.61	1,471,455.32	2,028,901.87	198,944.12	45,652.64	830,635.40	2,988,941.82	24,722,336.55	
			84,767.47	31,872.76		44,728.47	17,429,965.32	
				16,507.77		1,576,454.24	53,487,546.13	
237,584.61	1,471,455.32	2,028,901.87	283,711.59	94,033.17	830,635.40	4,610,124.53	95,639,848.00	

V.—Deposits of Unrefined Silver of Domestic Production, with the States and and Refined Bullion (Fineness 0.992 and over) and of Domestic Bullion not

	Source of deposits.	Coinage mints.			Assay offices.	
		Philadelphia.	San Francisco.	New Orleans.	New York.	Denver.
		Stand. ozs.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*
1	Alabama	5.42		28.52		
2	Alaska	111.63	1,072.43	1.22	49.88	36.49
3	Arizona	255.61	7,266.32	6.67	38.70	14,195.25
4	California	85.92	39,598.21		827.89	44.67
5	Colorado	5.28	592.17	25.19	21.93	83,890.38
6	Georgia	130.13			2.50	
7	Idaho	465.80	154.14		20.88	87.36
8	Kansas	.66				
9	Maryland	2.53				
10	Michigan	4,459.93			32,118.95	
11	Minnesota	1.98				
12	Montana	1,565.89	13.75		14,497.83	10.73
13	Nevada	3.82	4,356.88		8,229.54	
14	New Mexico	57.48	26.99		10,104.42	873.52
15	North Carolina	52.83			16.22	
16	Oklahoma					
17	Oregon	16.28	1,653.95			3.15
18	South Carolina					
19	South Dakota	115.67			70,306.23	1.93
20	Tennessee					
21	Utah		98.53		50,611.65	1,546.64
22	Vermont				4.81	
23	Virginia	9.45				
24	Washington	3.06	61.70			5.64
25	Wyoming	7.46				30.68
26	Other States	31.37	2.81			
27	Porto Rico				100.73	
28	Philippine Islands	2.53				
	Total unrefined	7,390.73	54,897.88	61.60	186,952.16	100,726.44
	Refinery bars (fineness below 0.992)				128,113.66	2,744.18
	Refined bullion (fineness 0.992 and over)	685,527.32			1,579,313.83	
	Total silver	692,918.05	54,897.88	61.60	1,894,379.65	103,470.62

Territories Producing the Same, and also of Refined Bars (Fineness below 0.992) Distributed, by Weight, during the Calendar Year ended December 31, 1902.

ASSAY OFFICES.							Total.	
Carson.	Boise.	Helena.	Charlotte.	St. Louis.	Deadwood.	Seattle.		
Stand. ozs.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	
....	....	....	70.84	....	....	....	104.78	1
....	....	6.39	....	6.69	....	18,303.76	19,588.49	2
....	....	....	....	51.22	....	....	21,813.77	3
815.78	....	....	....	....	....	1.01	41,373.48	4
....	....	....	.56	421.36	....	....	84,956.87	5
....	....	....	253.13	.41	....	....	386.17	6
....	18,673.72	2,353.04	....	....	....	238.38	21,993.32	7
....	....	....	....	....	....	....	.66	8
....	....	....	....	....	....	....	2.53	9
....	....	....	....	....	....	....	36,578.88	10
....	....	....	....	....	....	....	1.98	11
....	1,991.75	20,935.51	....	310.43	....	17.22	39,343.11	12
6,552.81	....	1,501.69	....	....	....	....	20,644.74	13
....	....	....	....	4.94	....	....	11,067.35	14
....	....	....	776.57	....	....	....	845.62	15
....	....	....	....	2.94	....	....	2.94	16
....	9,392.16	6.50	....	....	....	25.10	11,097.14	17
....	....	....	287.24	....	....	....	287.24	18
....	....	....	....	....	19,719.61	....	90,143.44	19
....	....	....	.57	....	....	....	.57	20
....	2.21	....	....	....	....	....	52,259.03	21
....	....	....	....	....	....	....	4.81	22
....	....	....	.11	....	....	....	9.56	23
....	24.61	145.42	....	....	....	488.19	728.62	24
....	....	....	....	....	....	....	38.14	25
....	....	....	....	2.12	....	....	36.30	26
....	....	....	....	....	....	....	100.73	27
....	....	....	....	....	....	....	2.53	28
7,368.59	30,084.45	24,948.55	1,389.02	800.11	19,719.61	19,073.66	453,412.80	
....	....	....	....	20.53	....	....	130,878.37	
....	....	....	....	....	....	....	2,264,841.15	
7,368.59	30,084.45	24,948.55	1,389.02	820.64	19,719.61	19,073.66	2,849,132.32	

VI.—Deposits of Unrefined Silver of Domestic Production, with the States and 0.992) and Refined Bullion (Fineness 0.992 and over) of Domestic Bullion not

	Source of deposits.	COINAGE MINTS.			ASSAY OFFICES.	
		Philadelphia.	San Francisco.	New Orleans.	New York.	Denver.
1	Alabama	$6.31		$33.19		
2	Alaska	129.90	$1,247.92	1.42	$58.04	$42.46
3	Arizona	297.44	8,455.35	7.76	45.03	16,518.10
4	California	99.98	46,077.92		963.36	51.98
5	Colorado	6.14	689.07	29.31	25.52	97,617.89
6	Georgia	151.42			2.91	
7	Idaho	542.02	179.36		24.30	101.66
8	Kansas	.77				
9	Maryland	2.94				
10	Michigan	5,189.74			37,374.78	
11	Minnesota	2.30				
12	Montana	1,822.13	16.00		16,870.20	12.49
13	Nevada	4.45	5,069.82		9,576.19	
14	New Mexico	66.89	31.41		11,757.88	1,016.46
15	North Carolina	61.47			18.87	
16	Oklahoma					
17	Oregon	18.94	1,924.60			3.67
18	South Carolina					
19	South Dakota	134.60			81,810.88	2.25
20	Tennessee					
21	Utah		114.65		58,893.55	1,799.73
22	Vermont				5.60	
23	Virginia	11.00				
24	Washington	3.56	71.80			6.57
25	Wyoming	8.68				35.70
26	Other States	36.50	3.27			
27	Porto Rico				117.21	
28	Philippine Islands	2.94				
	Total unrefined	8,600.12	63,881.17	71.68	217,544.32	117,208.96
	Refinery bars (fineness below 0.992)				149,077.72	3,193.22
	Refined bullion (fineness 0.992 and over)	797,704.52			1,837,747.00	
	Total silver	806,304.64	63,881.17	71.68	2,204,369.04	120,402.18

VII.—Bars Manufactured of Gold and Silver, by Weight,

Description.	COINAGE MINTS.			ASSAY OFFICES.	
	Philadelphia.	San Francisco.	New Orleans.	Carson.	New York.
GOLD.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*
Fine bars	193,353.374		456.982		2,421,414.366
Mint bars					230,572.987
Standard bars					63,780.256
Unparted bars	9.603	15.068		12,899.108	
Total gold	193,362.977	15.068	456.982	12,899.108	2,715,767.609
SILVER.					
Fine bars	142,179.30	34,909.54	3,902.95		3,401,207.09
Mint bars					106,552.27
Standard bars					
Unparted bars	3.53	5.45		7,417.65	
Total silver	142,182.83	34,914.99	3,902.95	7,417.65	3,507,759.36

Territories Producing the Same, and also of Refined Bars (Fineness below
Distributed, by Value, during the Calendar Year ended December 31, 1902.

Assay offices.							Total.	
Carson.	Boise.	Helena.	Charlotte.	St. Louis.	Deadwood.	Seattle.		
			$82.43				$121.93	1
		$7.43		$7.78		$21,298.92	22,793.87	2
				59.59			25,383.27	3
$949.27						1.17	48,143.68	4
			.65	490.30			98,858.88	5
			294.55	.47			449.35	6
	$21,729.42	2,738.09				277.39	25,592.24	7
							.77	8
							2.94	9
							42,564.52	10
							2.30	11
	2,317.67	24,361.32		361.22		20.04	45,781.07	12
7,625.08		1,747.42					24,022.96	13
				5.74			12,878.38	14
			903.64				983.98	15
				3.42			3.42	16
	10,929.06	7.56				29.21	12,913.04	17
			334.24				334.24	18
					$22,946.45		104,894.18	19
			.67				.67	20
	2.57						60,810.50	21
							5.60	22
			.13				11.13	23
	28.64	169.22				568.07	847.86	24
							44.38	25
				2.48			42.25	26
							117.21	27
							2.94	28
8,574.35	35,007.36	29,031.04	1,616.31	931.00	22,946.45	22,194.80	527,607.56	
				23.88			152,294.82	
							2,635,451.52	
8,574.35	35,007.36	29,031.04	1,616.31	954.88	22,946.45	22,194.80	3,315,353.90	

during the Calendar Year ended December 31, 1902.

Assay offices.							Total.
Denver.	Boise.	Helena.	Charlotte.	St. Louis.	Dead-wood.	Seattle.	
Stand. ozs.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*
						87,138.571	2,702,363.293
							230,572.987
							63,780.256
872,807.460	79,090.957	121,773.842	15,438.351	6,690.772	44,798.011	547,742.307	1,701,265.479
872,807.460	79,090.957	121,773.842	15,438.351	6,690.772	44,798.011	634,880.878	4,697,982.015
							3,582,198.88
							106,552.27
104,127.35	30,084.45	32,813.55	1,513.67	1,212.56	19,719.61	109,966.32	306,864.14
104,127.35	30,084.45	32,813.55	1,513.67	1,212.56	19,719.61	109,966.32	3,995,615.29

VIII.—Bars Manufactured of Gold and Silver, by Value,

Description.	COINAGE MINTS.			ASSAY OFFICES.	
	Philadelphia.	San Francisco.	New Orleans.	Carson.	New York.
GOLD.					
Fine bars	$3,597,272.08		$8,501.94		$15,049,569.59
Mint bars					4,289,730.00
Standard bars					1,186,609.41
Unparted bars	178.65	$280.33		$239,983.43	
Total gold	3,597,450.73	280.33	8,501.94	239,983.43	50,525,909.00
SILVER.					
Fine bars	165,445.00	40,622.01	4,541.61		3,957,768.25
Mint bars					123,988.10
Standard bars					
Unparted bars	4.10	6.34		8,631.44	
Total silver	165,449.10	40,628.35	4,541.61	8,631.44	4,081,756.35
Total value	3,762,899.83	40,908.68	13,043.55	248,614.87	54,607,665.35

IX.—Mutilated and Uncurrent Domestic Gold and Silver Coins Transferred Calendar Year ended

Denomination.	PHILADELPHIA.		SAN FRANCISCO.		NEW ORLEANS.	
	Received from Treasury.	Purchased.	Received from Treasury.	Purchased.	Received from Treasury.	Purchased.
GOLD.						
Double eagles	$223,600.00	$16,640.00	$6,100.00	$5,100.00		$4,060.00
Eagles	122,990.00	6,550.00	4,840.00	1,090.00		1,010.00
Half eagles	178,625.00	12,635.00	5,980.00	1,885.00		2,140.00
Three-dollar pieces	3.00	36.00		6.00		
Quarter eagles	3,870.00	3,832.50	7.50	67.50		27.50
Dollars	23.00	175.00		12.00		20.00
Total gold, face value	529,111.00	39,868.50	16,927.50	8,160.50		7,257.50
SILVER.						
Trade dollars		177.00				1.00
Standard dollars		1,376.00		54.00		279.00
Half dollars	1,043,110.50	625.00	82,000.00	74.50	$343,079.00	29.00
Quarter dollars	791,398.50	431.50	44,000.00	18.25	211,920.75	44.50
Twenty-cent pieces	265.80		8.60		5.40	.20
Dimes	694,325.60	166.70	20,000.00	18.70	126,188.80	24.40
Half dimes	1,528.95	18.00	199.15		49.70	1.65
Three-cent pieces	131.38	1.38	3.96		1.35	
Total silver, face value	2,530,760.73	2,795.58	146,211.71	165.45	681,245.00	379.75
SUMMARY.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*
Gold coins	28,215.100	2,126.058	895.391	408.147		386.767
Silver coins	1,917,807.65	2,299.00	111,045.26	129.00	513,099.80	312.52
Gold, coining value	$524,932.09	$39,554.57	$16,658.44	$7,593.43		$7,195.67
Silver, subsidiary value	$2,386,074.84	$2,860.34	$138,158.95	$160.50	$638,382.33	$388.83
Loss, gold	$4,178.91	$313.93	$269.06	$567.07		$61.83
Loss, silver subsidiary	$144,685.89		$8,052.76	$4.95	$42,862.67	
Gain, silver subsidiary		$64.76				$9.07

during the Calendar Year ended December 31, 1902.

ASSAY OFFICES.							Total.
Denver.	Boise.	Helena.	Charlotte.	St. Louis.	Deadwood.	Seattle.	
....	....	....	....	....	....	$1,621,182.71	$50,276,526.32
....	....	....	....	....	....	....	4,289,730.00
....	....	....	....	....	....	....	1,186,609.41
$16,238,278.33	$1,471,455.32	$2,265,559.33	$287,224.51	$124,478.41	$833,450.40	10,190,552.58	31,651,441.29
16,238,278.33	1,471,455.32	2,265,559.33	287,224.51	124,478.41	833,450.40	11,811,735.29	87,404,307.02
....	....	....	....	....	....	....	4,168,376.87
....	....	....	....	....	....	....	123,988.10
121,166.38	35,007.36	38,183.04	1,761.36	1,410.91	22,945.45	127,960.80	357,077.18
121,166.38	35,007.36	38,183.04	1,761.36	1,410.91	22,945.45	127,960.80	4,649,442.15
16,359,444.71	1,506,462.68	2,303,742.37	288,985.87	125,889.32	856,395.85	11,939,696.09	92,053,749.17

from the Treasury and Purchased over the Counter for Recoinage during the December 31, 1901.

NEW YORK.	DENVER.	CHARLOTTE.	ST. LOUIS.	DEADWOOD.	TOTAL.		
Purchased.	Purchased.	Purchased.	Purchased.	Purchased.	Received from Treasury.	Purchased.	Received from Treasury and purchased.
$136,560.00	$80.00	$20.00	$20.00	$2,800.00	$229,700.00	$165,280.00	$391,980.00
276,120.00	70.00	20.00	55.00	10.00	127,830.00	284,925.00	412,755.00
122,210.00	70.00	25.00	45.00	5.00	184,605.00	139,015.00	323,620.00
51.00	....	6.00	....	....	3.00	99.00	102.00
7,890.00	17.50	....	12.50	....	3,877.50	11,847.50	15,725.00
187.00	....	8.00	5.00	....	23.00	407.00	430.00
543,018.00	237.50	79.00	137.50	2,815.00	546,038.50	601,573.50	1,147,612.00
231.00	....	....	....	....	....	409.00	409.00
....	....	....	....	....	....	1,709.00	1,709.00
....	....	....	....	....	1,468,189.50	728.50	1,468,918.00
....	....	....	....	....	1,047,319.25	494.25	1,047,813.50
....	....	....	....	....	279.80	.20	280.00
....	....	....	....	....	840,514.40	209.80	840,724.20
....	....	....	....	....	1,777.80	19.65	1,797.45
....	....	....	....	....	136.69	1.38	138.07
231.00	....	....	....	....	3,358,217.41	3,571.78	3,361,789.22
Stand. ozs.	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*	*Stand. ozs.*
28,920.071	12.010	4.025	7.107	151.307	29,110.491	32,015.492	61,125.983
161.33	....	....	....	....	2,541,952.71	2,901.85	2,544,854.56
$538,047.84	$223.45	$74.90	$132.14	$2,815.00	$541,590.53	$595,637.00	$1,137,227.53
$200.72	....	....	....	....	$3,162,616.12	$3,610.39	$3,166,226.51
$4,970.17	$14.05	$4.10	$5.36	....	$4,447.97	$5,936.50	$10,384.47
$30.28	....	....	....	....	$195,700.32	$35.23	$195,735.54
....	....	....	....	....	....	$73.83	$73.83

X.—Quantity and Cost of Silver Used in the Coinage of Silver Dollars, Dollars Coined, and Seigniorage on Same, during the Calendar Year 1902.

MINT AT PHILADELPHIA.

Months.	Used in coinage.		Dollars coined.	Seigniorage.
	Standard ounces.	Cost.		
1902.				
January	687,500.00	$559,841.59	$800,000.00	$240,158.41
February	675,468.75	550,044.37	786,000.00	235,955.63
March	644,799.38	525,069.84	750,312.00	225,242.16
April	859,430.86	699,847.48	1,000,065.00	300,217.52
May	429,687.50	349,901.00	500,000.00	150,099.00
June	503,645.31	410,125.95	586,060.00	175,934.05
July	429,687.50	349,901.00	500,000.00	150,099.00
August	668,593.75	544,445.95	778,000.00	233,554.05
September	905,832.81	737,633.29	1,054,060.00	316,426.71
October				
November	623,906.25	508,056.25	726,000.00	217,943.75
December	441,959.38	359,894.17	514,280.00	154,385.83
Total	6,870,511.49	5,594,760.89	7,994,777.00	2,400,016.11

MINT AT SAN FRANCISCO.

1902.				
January				
February				
March				
April				
May				
June				
July				
August				
September	429,687.50	$349,900.79	$500,000.00	$150,099.21
October	438,281.25	356,898.82	510,000.00	153,101.18
November	446,875.00	363,896.84	520,000.00	156,103.16
December				
Total	1,314,843.75	1,070,696.45	1,530,000.00	459,303.55

MINT AT NEW ORLEANS.

1902.				
January	1,289,062.50	$1,049,702.89	$1,500,000.00	$450,297.11
February	644,531.25	524,851.45	750,000.00	225,148.55
March	644,531.25	524,851.45	750,000.00	225,148.55
April	429,687.50	349,900.97	500,000.00	150,099.03
May	859,375.00	699,801.93	1,000,000.00	300,198.07
June	275,000.00	223,936.62	320,000.00	96,063.38
July	472,656.25	384,891.06	550,000.00	165,108.94
August	859,375.00	699,801.93	1,000,000.00	300,198.07
September	1,031,250.00	839,762.35	1,200,000.00	360,237.65
October	429,687.50	349,900.99	500,000.00	150,099.01
November	429,687.50	349,900.99	500,000.00	150,099.01
December	56,718.75	46,186.93	66,000.00	19,813.07
Total	7,421,562.50	6,043,489.56	8,636,000.00	2,592,510.44

SUMMARY.

1902.				
January	1,976,562.50	$1,609,544.48	$2,300,000.00	$690,455.52
February	1,320,000.00	1,074,895.82	1,536,000.00	461,104.18
March	1,289,330.63	1,049,921.29	1,500,312.00	450,390.71
April	1,289,118.36	1,049,748.45	1,500,065.00	450,316.55
May	1,289,062.50	1,049,702.93	1,500,000.00	450,297.07
June	778,645.31	634,062.57	906,060.00	271,997.43
July	902,343.75	734,792.06	1,050,000.00	315,207.94
August	1,527,968.75	1,244,247.88	1,778,000.00	533,752.12
September	2,366,770.31	1,927,296.43	2,754,060.00	826,763.57
October	867,968.75	706,799.81	1,010,000.00	303,200.19
November	1,500,468.75	1,221,854.08	1,746,000.00	524,145.92
December	498,678.13	406,081.10	580,280.00	174,198.90
Total	15,606,917.74	12,708,946.90	18,160,777.00	5,451,830.10

XI.—Quantity and Cost of Silver Obtained by Transfer and Purchase for Subsidiary Silver Coinage, Amount and Cost Used in Coinage, Coinage Derived Therefrom, and Seigniorage on Same during the Calendar Year 1902.

Sources from which bullion was obtained.	Standard ounces.	Cost.	Used in coinage (standard ounces).	Cost.	Coinage.	Seigniorage.
MINT AT PHILADELPHIA.						
Silver bullion on hand Jan. 1, 1902	1,315,511.55	$1,412,501.31				
Uncurrent coins transferred from Treasury	1,917,807.65	2,386,074.84	2,789,816.25	$3,471,000.00	$3,471,000.00	
Amount transferred from act July 14, 1890	3,357,263.75	2,733,870.38	3,357,263.75	2,733,870.38	4,177,000.00	$1,443,129.62
Porto Rican coins redeemed and melted	194.31	148.50	194.31	148.50	241.75	93.25
Partings, charges, and fractions purchased	205,891.10	96,983.74	530.83	288.31	660.45	372.14
Melted assay coins purchased	681.08	807.35				
Mutilated coins purchased	1,520.10	713.51				
Surplus bullion purchased	18,391.24	10,032.93				
Total	6,817,260.78	6,641,132.56	6,147,805.14	6,205,307.19	7,648,902.20	1,443,595.01
Used in coinage calendar year 1902	6,147,805.14	6,205,307.19				
Sold in sweeps	7,072.78	3,879.88				
Wasted by operative officers	10,784.71	5,960.48				
Balance on hand Jan. 1, 1903	651,598.12	425,985.01				
Total	6,817,260.78	6,641,132.56				
MINT AT SAN FRANCISCO.						
Silver bullion on hand Jan. 1, 1902	324,509.83	184,869.29				
Uncurrent coins transferred from Treasury	111,045.26	138,158.95	92,823.48	115,488.00	115,488.00	
Amount transferred from act July 14, 1890	650,233.75	529,494.53	650,233.75	529,494.53	809,000.00	279,505.47
Partings, charges, and fractions purchased	180,004.20	83,550.41	316,677.50	171,657.34	394,000.00	222,342.66
Mutilated coins purchased	129.00	58.90				
Surplus bullion purchased	1,224.02	604.75				
Total	1,267,146.06	936,736.83	1,059,734.73	816,639.87	1,318,488.00	501,848.13
Used in coinage calendar year 1902	1,059,734.73	816,639.87				
Sold in sweeps	6,109.89	3,127.65				
Wasted by operative officers	1,857.04	993.59				
Balance on hand Jan. 1, 1903	199,444.40	115,975.72				
Total	1,267,146.06	936,736.83				
MINT AT NEW ORLEANS.						
Silver bullion on hand Jan. 1, 1902	301,187.54	374,100.34				
Uncurrent coins transferred from Treasury	513,099.80	638,382.33	802,946.25	999,000.00	999,000.00	
Amount transferred from act of July 14, 1890	1,527,928.75	1,244,215.24	1,527,928.75	1,244,215.24	1,901,000.00	656,784.76
Partings, charges, and fractions purchased	34,571.67	16,473.04				
Amount weigh clerk's embezzlement refunded by bondsman	622.90	775.00				
Mutilated coins purchased	528.02	246.02				
Surplus bullion purchased	13.37	6.15				
Total	2,377,952.05	2,271,198.12	2,330,875.00	2,243,215.24	2,900,000.00	656,784.76

XI.—QUANTITY AND COST OF SILVER OBTAINED BY TRANSFER AND PURCHASE FOR SUBSIDIARY SILVER COINAGE, ETC.—Continued.

Sources from which bullion was obtained.	Standard ounces.	Cost.	Used in coinage (standard ounces).	Cost.	Coinage.	Seigniorage.
Used in coinage calendar year 1902	2,330,875.00	$2,243,215.24				
Amount embezzled by weigh clerk	622.90	775.00				
Sold in sweeps	19,655.04	9,261.99				
Wasted by operative officers	14,479.48	6,929.41				
Balance on hand Jan. 1, 1903	12,319.63	14,016.48				
Total	2,377,952.05	2,274,198.12				
SUMMARY.						
Silver bullion on hand Jan. 1, 1902	1,941,208.92	1,971,470.94				
Uncurrent coins transferred from Treasury	2,541,952.71	3,162,616.12	3,685,585.98	$4,585,488.00	$4,585,488.00	
Amount transferred from act of July 14, 1890	5,535,426.25	4,507,580.15	5,535,426.25	4,507,580.15	6,887,000.00	2,379,419.85
Porto Rican coins redeemed and melted	194.31	148.50	194.31	148.50	241.75	93.25
Partings, charges, and fractions purchased	420,466.97	197,007.19	317,208.33	171,945.65	394,660.45	222,714.80
Amount weigh clerk's embezzlement at New Orleans refunded by bondsmen	622.90	775.00				
Melted assay coins purchased	681.08	807.35				
Mutilated coins purchased	2,177.12	1,018.43				
Surplus bullion purchased	19,628.63	10,643.83				
Total	10,462,358.89	9,852,067.51	9,538,414.87	9,265,162.30	11,867,390.20	2,602,227.90
Used in coinage calendar year 1902	9,538,414.87	9,265,162.30				
Amount embezzled by weigh clerk at New Orleans	622.90	775.00				
Sold in sweeps	32,837.71	16,269.52				
Wasted by operative officers	27,121.26	13,883.48				
Balance on hand Jan. 1, 1903	863,362.15	555,977.21				
Total	10,462,358.89	9,852,067.51				

XII.—COINAGE OF THE UNITED STATES MINTS DURING

DENOMINATION.	PHILADELPHIA.	
	Number of pieces.	Value.
GOLD.		
Double eagles	31,254	$625,080.00
Eagles	82,513	825,130.00
Half eagles	172,562	862,810.00
Quarter eagles	133,733	334,332.50
Dollars, Louisiana Exposition, act of June 28, 1902	75,080	75,080.00
Total gold	495,142	2,722,432.50
SILVER.		
Dollars	7,994,777	7,994,777.00
Subsidiary:		
Half dollars	4,922,777	2,461,388.50
Quarter dollars	12,197,744	3,049,436.00
Dimes	21,380,777	2,138,077.70
Total subsidiary	38,501,298	7,648,902.20
Total silver	46,496,075	15,643,679.20
MINOR.		
Five-cent nickels	31,480,579	1,574,028.95
One-cent bronze	87,376,722	873,767.22
Total minor	118,857,301	2,447,796.17
Total coinage	165,848,518	20,813,907.87

Coinage of silver dollars:		
Act of February 28, 1878, Bland-Allison		$378,166,793
Act of July 14, 1890, Sherman, as follows:		
From July 14, 1890, to repeal of purchasing clause of Sherman Act, October 31, 1893	$36,087,285	
From November 1, 1893, to June 12, 1898	42,139,872	
Coined under war-revenue act approved June 13, 1898	89,643,783	
		167,870,940
Act of March 3, 1891, recoinage of trade dollars		5,078,472
Total		551,116,205

THE CALENDAR YEAR ENDED DECEMBER 31, 1902.

SAN FRANCISCO.		NEW ORLEANS.		TOTAL.	
Number of pieces.	Value.	Number of pieces.	Value.	Number of pieces.	Value.
1,753,625	$35,072,500.00			1,784,879	$35,697,580.00
469,500	4,695,000.00			552,013	5,520,130.00
939,000	4,695,000.00			1,111,562	5,557,810.00
				133,733	334,332.50
				75,080	75,080.00
3,162,125	44,462,500.00			3,657,267	47,184,932.50
1,530,000	1,530,000.00	8,636,000	$8,636,000.00	18,160,777	18,160,777.00
1,460,670	730,335.00	2,526,000	1,263,000.00	8,909,447	4,454,723.50
1,524,612	381,153.00	4,748,000	1,187,000.00	18,470,356	4,617,589.00
2,070,000	207,000.00	4,500,000	450,000.00	27,950,777	2,795,077.70
5,055,282	1,318,488.00	11,774,000	2,900,000.00	55,330,580	11,867,390.20
6,585,282	2,848,488.00	20,410,000	11,536,000.00	73,491,357	30,028,167.20
				31,480,579	1,574,028.95
				87,376,722	873,767.22
				118,857,301	2,447,796.17
9,747,407	47,310,988.00	20,410,000	11,536,000.00	196,005,925	79,660,895.87

XIII.—ASSETS AND LIABILITIES OF THE UNITED STATES

ASSETS.

Institutions.	Gold bullion.		Silver bullion.		Value of gold bullion shipped for coinage.
	Standard ounces.	Value.	Standard ounces.	Value (cost).	
COINAGE MINTS.					
Philadelphia	5,099,430.360	$94,873,123.00	18,503,682.67	$14,963,206.09	....
San Francisco	1,149,440.188	21,384,933.69	1,335,314.40	1,040,931.24	....
New Orleans	62,354.225	1,160,078.29	9,368,136.56	7,632,598.80	....
ASSAY OFFICES.					
New York	2,238,944.715	41,654,785.31	775,961.09	483,127.72	....
Carson	181.756	3,381.47	2,294.99	1,208.01	$19,392.31
Denver	24,785.527	461,126.09	2,774.68	1,220.86	320,873.92
Helena	5,191.625	96,588.38	1,410.43	620.59	....
Boise	3,013.176	56,059.11	970.73	427.12	....
Charlotte	89.125	1,658.14	14.61	6.43	....
St. Louis	543.162	10,105.34	89.11	39.21	....
Deadwood	3,162.562	58,838.37	1,686.91	742.24	....
Seattle	11,326.483	210,725.28	1,493.61	657.19	254,308.94
Total	8,598,462.904	159,971,402.47	29,993,829.79	24,124,785.50	594,575.17

LIABILITIES.

Institutions.	Bullion fund.	Undeposited earnings.
COINAGE MINTS.		
Philadelphia	$264,300,617.74	....
San Francisco	172,988,871.51	....
New Orleans	30,677,713.47	....
ASSAY OFFICES.		
New York	42,532,275.86	$20,147.93
Carson	173,765.10	192.96
Denver	1,289,440.19	2,552.13
Helena	276,107.11	1,135.25
Boise	115,450.75	23.01
Charlotte	36,728.38	9.26
St. Louis	20,339.41	81.71
Deadwood	111,459.69	246.74
Seattle	1,440,888.02	3,380.20
Total	513,963,657.23	27,769.19

Mints and Assay Offices, December 31, 1902.

ASSETS.

Gold coin.	Silver coin.	Credit balance with Assistant Treasurer and depository banks.	Minor coin.	Minor coinage metal.	Deficiencies.	Total.
$55,500,412.50	$99,105,800.38		$468,436.36	$133,115.28	$13,543.82	$265,057,637.43
88,860,060.00	57,473,616.36	a$4,187,338.58			413,557.96	173,360,437.83
69,295.00	21,789,896.47	a 20,731.77			25,000.00	30,697,600.33
13,840.00	4,469.08	b 895,582.13				43,051,804.24
19,275.00	9,136.82	a 46,014.70			75,549.75	173,958.06
		508,771.45				1,291,992.32
		180,033.39				277,242.36
		58,987.53				115,473.76
		35,073.07				36,737.64
		10,276.57				20,421.12
		52,125.82				111,706.43
		978,597.48				1,444,288.89
144,462,882.50	178,382,919.11	6,973,532.49	468,436.36	133,115.28	527,651.53	515,639,300.41

a Gold coin.

b Gold coin, $801,002.40; silver coin, $94,579.73.

LIABILITIES.

Seigniorage on silver.	Unpaid depositors.	Minor coinage profits.	Minor coin metal fund.	Unpaid cent depositors and subtreasury minor coin transfers.	Total.
$155,312.38	$155.67	$143,947.91	$49,165.40	$408,438.33	$265,057,637.43
	371,566.32				173,360,437.83
19,813.07	73.79				30,697,600.33
	499,380.45				43,051,804.24
					173,958.06
					1,291,992.32
					277,242.36
					115,473.76
					36,737.64
					20,421.12
					111,706.43
	20.67				1,444,288.89
175,125.45	871,196.90	143,947.91	49,165.40	408,438.33	515,639,300.41

XIV.—UNREFINED GOLD AND SILVER OF DOMESTIC PRODUCTION, BY VALUE, ITS DISTRIBUTION, BY STATES AND TERRITORIES; ALSO REFINED DOMESTIC BULLION (NOT DISTRIBUTED) DEPOSITED AT THE MINTS AND ASSAY OFFICES FROM THEIR ORGANIZATION TO THE CLOSE OF THE CALENDAR YEAR ENDED DECEMBER 31, 1902.

Locality.	Gold.	Silver.	Total.
Alabama	$277,336.66	$833.55	$278,170.21
Alaska	14,983,320.57	133,674.77	15,116,995.34
Arizona	13,700,080.73	14,232,506.71	27,932,587.44
California	792,948,379.89	4,582,086.05	797,530,465.94
Connecticut	125.82	....	125.82
Colorado	93,596,051.85	25,350,495.57	118,946,547.42
Georgia	10,185,204.82	11,625.63	10,196,830.45
Idaho	43,168,537.79	2,113,342.91	45,281,880.70
Indiana	333.46	1.73	335.19
Iowa	1,318.17	8.03	1,326.20
Kansas	159.83	1.02	160.85
Maine	35,703.62	3,719.21	39,422.83
Maryland	22,039.74	48.05	22,087.79
Michigan	502,847.19	4,350,445.34	4,853,292.53
Minnesota	9,180.62	118.57	9,299.19
Missouri	893.61	538.62	1,432.23
Montana	89,713,899.10	22,577,178.96	112,291,078.06
Nebraska	2,340.26	273,226.13	275,566.39
Nevada	45,056,539.40	105,738,818.65	150,795,358.05
New Hampshire	481.34	1.75	483.09
New Mexico	7,410,343.47	7,261,142.29	14,671,485.76
New York	1,058.83	.62	1,059.45
North Carolina	12,144,568.75	72,111.82	12,216,680.57
Oklahoma	181.69	3.42	185.11
Oregon	28,134,559.16	203,993.22	28,338,552.38
South Carolina	2,872,306.92	7,137.61	2,879,444.53
South Dakota	85,719,410.00	1,552,402.61	87,271,812.61
Tennessee	92,554.55	18.67	92,573.22
Texas	11,634.80	3,462.81	15,097.61
Utah	7,772,254.07	20,080,039.83	27,852,293.90
Vermont	80,036.35	99.28	80,135.63
Virginia	1,793,662.75	635.02	1,794,297.77
Washington	2,320,930.92	47,406.65	2,368,337.57
West Virginia	243.74	3.72	247.46
Wisconsin	1,109.77	38.54	1,148.31
Wyoming	1,006,605.69	14,245.32	1,020,851.01
Other sources	42,218,814.39	42,962,988.50	85,181,802.89
Porto Rico (since 1902)	2,424.07	117.21	2,541.28
Philippine Islands (since 1902)	243.82	2.94	246.76
Unrefined	1,295,787,718.21	251,574,521.33	1,547,362,239.54
Refined	910,510,152.23	565,272,049.92	1,475,782,202.15
Total	2,206,297,870.44	816,846,571.25	3,023,144,441.69

XV.—PRODUCT OF GOLD AND SILVER IN THE UNITED STATES FROM 1792 TO 1844, AND ANNUALLY SINCE.

[The estimate for 1792–1873 is by R. W. Raymond, commissioner, and since by Director of the Mint.]

Year.	Gold.	Silver (coining value).	Total.
April 2, 1792–July 31, 1834	$14,000,000	Insignificant.	$14,000,000
July 31, 1834–December 31, 1844	7,500,000	$250,000	7,750,000
1845	1,008,000	50,000	1,058,000
1846	1,140,000	50,000	1,190,000
1847	889,000	50,000	939,000
1848	10,000,000	50,000	10,050,000
1849	40,000,000	50,000	40,050,000
1850	50,000,000	50,000	50,050,000
1851	55,000,000	50,000	55,050,000
1852	60,000,000	50,000	60,050,000
1853	65,000,000	50,000	65,050,000
1854	60,000,000	50,000	60,050,000
1855	55,000,000	50,000	55,050,000
1856	55,000,000	50,000	55,050,000
1857	55,000,000	50,000	55,050,000
1858	50,000,000	500,000	50,500,000
1859	50,000,000	100,000	50,100,000
1860	46,000,000	150,000	46,150,000
1861	43,000,000	2,000,000	45,000,000
1862	39,200,000	4,500,000	43,700,000
1863	40,000,000	8,500,000	48,500,000
1864	46,100,000	11,000,000	57,100,000
1865	53,225,000	11,250,000	64,475,000
1866	53,500,000	10,000,000	63,500,000
1867	51,725,000	13,500,000	65,225,000
1868	48,000,000	12,000,000	60,000,000
1869	49,500,000	12,000,000	61,500,000
1870	50,000,000	16,000,000	66,000,000
1871	43,500,000	23,000,000	66,500,000
1872	36,000,000	28,750,000	64,750,000
1873	36,000,000	35,750,000	71,750,000
1874	33,500,000	37,300,000	70,800,000
1875	33,400,000	31,700,000	65,100,000
1876	39,900,000	38,800,000	78,700,000
1877	46,900,000	39,800,000	86,700,000
1878	51,200,000	45,200,000	96,400,000
1879	38,900,000	40,800,000	79,700,000
1880	36,000,000	39,200,000	75,200,000
1881	34,700,000	43,000,000	77,700,000
1882	32,500,000	46,800,000	79,300,000
1883	30,000,000	46,200,000	76,200,000
1884	30,800,000	48,800,000	79,600,000
1885	31,800,000	51,600,000	83,400,000
1886	35,000,000	51,000,000	86,000,000
1887	33,000,000	53,350,000	86,350,000
1888	33,175,000	59,195,000	92,370,000
1889	32,800,000	64,646,000	97,446,000
1890	32,845,000	70,465,000	103,310,000
1891	33,175,000	75,417,000	108,592,000
1892	33,000,000	82,101,000	115,101,000
1893	35,955,000	77,576,000	113,531,000
1894	39,500,000	64,000,000	103,500,000
1895	46,610,000	72,051,000	118,661,000
1896	53,088,000	76,069,000	129,157,000
1897	57,363,000	69,637,000	127,000,000
1898	64,463,000	70,384,000	134,847,000
1899	71,053,000	70,807,000	141,860.000
1900	79,171,000	74,533,000	153,704,000
1901	78,667,000	71,388,000	150,055,000
1902	80,000,000	71,758,000	151,758,000
Total	2,543,752,000	1,873,477,000	4,417,229,000

XVI.—Highest, Lowest, and Average Price of Bar Silver in London, per Ounce British Standard (.925), since 1833, and the Equivalent in United States Gold Coin of an Ounce 1,000 Fine, taken at the Average Price.

Calendar years.	Highest quotation.	Lowest quotation.	Average quotation.	Value of a fine ounce at average quotation.	Calendar years.	Highest quotation.	Lowest quotation.	Average quotation.	Value of a fine ounce at average quotation.
	d.	*d.*	*d.*	*Dollars.*		*d.*	*d.*	*d.*	*Dollars.*
1833	59 7/8	58 3/4	59 3/16	1.297	1868	61 1/8	60 1/8	60 1/2	1.326
1834	60 3/4	59 3/4	59 15/16	1.313	1869	61	60	60 7/16	1.325
1835	60	59 1/4	59 11/16	1.308	1870	60 3/4	60 1/4	60 9/16	1.328
1836	60 3/4	59 5/8	60	1.315	1871	61	60 3/16	60 1/2	1.326
1837	60 3/8	59	59 9/16	1.305	1872	61 1/8	59 1/4	60 5/16	1.322
1838	60 1/8	59 1/2	59 1/2	1.304	1873	59 15/16	57 7/8	59 3/16	1.29769
1839	60 5/8	60	60 3/8	1.323	1874	59 1/2	57 1/4	58 5/16	1.27883
1840	60 3/4	60 1/8	60 3/8	1.323	1875	57 5/8	55 1/2	56 11/16	1.24233
1841	60 3/8	59 3/4	60 1/16	1.316	1876	58 1/2	46 3/4	53 1/8	1.16414
1842	60	59 1/4	59 7/16	1.303	1877	58 1/4	53 1/4	54 13/16	1.20189
1843	59 5/8	59	59 3/16	1.297	1878	55 1/4	49 1/2	52 5/8	1.15358
1844	59 3/4	59 1/4	59 1/2	1.304	1879	53 3/4	58 7/8	51 1/4	1.12392
1845	59 7/8	58 7/8	59 1/4	1.298	1880	52 13/16	51 1/2	52 1/4	1.14507
1846	60 1/8	59	59 5/16	1.300	1881	52 7/8	50 7/8	51 5/8	1.13229
1847	60 3/8	58 7/8	59 11/16	1.308	1882	52 3/8	50	51 13/16	1.13562
1848	60	58 1/2	59 1/2	1.304	1883	51 3/16	50 1/16	50 9/16	1.10874
1849	60	59 1/2	59 3/4	1.309	1884	51 3/8	49 1/2	50 11/16	1.11068
1850	61 1/2	59 1/2	61 1/16	1.316	1885	50	46 7/8	48 9/16	1.06510
1851	61 5/8	60	61	1.337	1886	47	42	45 3/8	.99467
1852	61 7/8	59 7/8	60 1/2	1.326	1887	47 1/8	43 1/4	44 11/16	.97946
1853	61 7/8	60 5/8	61 1/2	1.348	1888	44 9/16	41 5/8	42 7/8	.93974
1854	61 7/8	60 7/8	61 1/2	1.348	1889	44 3/8	41 15/16	42 11/16	.93511
1855	61 5/8	60	61 5/16	1.344	1890	54 5/8	43 5/8	47 3/4	1.04634
1856	62 1/4	60 1/2	61 5/16	1.344	1891	48 3/4	43 1/2	45 1/16	.98800
1857	62 3/8	61	61 3/4	1.353	1892	43 3/4	37 7/8	39 3/4	.87145
1858	61 7/8	60 3/4	61 5/16	1.344	1893	38 3/4	30 1/2	35 9/16	.78030
1859	62 3/4	61 3/4	62 1/16	1.360	1894	31 3/4	27	28 15/16	.63479
1860	62 3/8	61 1/4	61 11/16	1.352	1895	31 3/8	27 3/16	29 13/16	.65406
1861	61 3/8	60 1/8	60 13/16	1.333	1896	31 15/16	29 3/4	30 13/16	.67565
1862	62 1/8	61	61 7/16	1.346	1897	29 13/16	23 5/8	27 9/16	.60438
1863	61 3/4	61	61 3/8	1.345	1898	28 3/8	25	26 15/16	.59010
1864	62 1/2	60 5/8	61 3/8	1.345	1899	29	26 5/8	27 7/16	.60154
1865	61 5/8	60 1/2	61 1/16	1.338	1900	30 1/4	27	28 5/16	.62007
1866	62 1/4	60 3/8	61 1/8	1.339	1901	29 9/16	24 15/16	27 3/16	.59595
1867	61 1/4	60 3/8	60 9/16	1.328	1902	26 1/16	21 11/16	24 1/16	.52795

XVII.—COMMERCIAL RATIO OF SILVER TO GOLD EACH YEAR SINCE 1687.

[NOTE.—From 1687 to 1832 the ratios are taken from Dr. A. Soetbeer; from 1833 to 1878 from Pixley and Abell's tables, and from 1879 to 1896 from daily cablegrams from London to the Bureau of the Mint.]

Years.	Ratio.	Years.	Ratio.	Years.	Ratio.	Years.	Ratio.	Years.	Ratio.	Years.	Ratio.
1687....	14.94	1723...	15.20	1759...	14.15	1795...	15.55	1831...	15.72	1867....	15.57
1688....	14.94	1724...	15.11	1760...	14.14	1796...	15.65	1832...	15.73	1868....	15.59
1689....	15.02	1725...	15.11	1761...	14.54	1797...	15.41	1833...	15.93	1869....	15.60
1690....	15.02	1726...	15.15	1762...	15.27	1798...	15.59	1834...	15.73	1870....	15.57
1691....	14.98	1727...	15.24	1763...	14.99	1799...	15.74	1835...	15.80	1871....	15.57
1692....	14.92	1728...	15.11	1764...	14.70	1800...	15.68	1836...	15.72	1872....	15.63
1693....	14.83	1729...	14.92	1765...	14.83	1801...	15.46	1837...	15.83	1873....	15.93
1684....	14.87	1730...	14.81	1766...	14.80	1802...	15.26	1838...	15.85	1874....	16.16
1695....	15.02	1731...	14.94	1767...	14.85	1803...	15.41	1839...	15.62	1875....	16.64
1696....	15.00	1732...	15.09	1768...	14.80	1804...	15.41	1840...	15.62	1876....	17.75
1697....	15.20	1733...	15.18	1769...	14.72	1805...	15.79	1841...	15.70	1877....	17.20
1698....	15.07	1734...	15.39	1770...	14.62	1806...	15.52	1842...	15.87	1878....	17.92
1699....	14.94	1735...	15.41	1771...	14.66	1807...	15.43	1843...	15.93	1879....	18.39
1700....	14.81	1736...	15.18	1772...	14.52	1808...	16.08	1844...	15.85	1880....	18.05
1701....	15.07	1737...	15.02	1773...	14.62	1809...	15.96	1845...	15.92	1881....	18.25
1702....	15.52	1738...	14.91	1774...	14.62	1810...	15.77	1846...	15.90	1882....	18.20
1703....	15.17	1739...	14.91	1775...	14.72	1811...	15.53	1847...	15.80	1883....	18.64
1704....	15.22	1740...	14.94	1776...	14.55	1812...	16.11	1848...	15.85	1884....	18.61
1705....	15.11	1741...	14.92	1777...	14.54	1813...	16.25	1849...	15.78	1885....	19.41
1706....	15.27	1742...	14.85	1778...	14.68	1814...	15.04	1850...	15.70	1886....	20.78
1707....	15.44	1743...	14.85	1779...	14.80	1815...	15.26	1851...	15.46	1887....	21.10
1708....	15.41	1744...	14.87	1780...	14.72	1816...	15.28	1852...	15.59	1888....	22.00
1709....	15.31	1745...	14.98	1781...	14.78	1817...	15.11	1853...	15.33	1889....	22.10
1710....	15.22	1746...	15.13	1782...	14.42	1818...	15.35	1854...	15.33	1890....	19.75
1711....	15.29	1747...	15.26	1783...	14.48	1819...	15.33	1855...	15.38	1891....	20.92
1712....	15.31	1748...	15.11	1784...	14.70	1820...	15.62	1856...	15.38	1892....	23.72
1713....	15.24	1749...	14.80	1785...	14.92	1821...	15.95	1857...	15.27	1893....	26.49
1714....	15.13	1750...	14.55	1786...	14.96	1822...	15.80	1858...	15.38	1894....	32.56
1715....	15.11	1751...	14.39	1787...	14.92	1823...	15.84	1859...	15.19	1895....	31.60
1716....	15.09	1752...	14.54	1788...	14.65	1824...	15.82	1860...	15.29	1896....	30.59
1717....	15.13	1753...	14.54	1789...	14.75	1825...	15.70	1861...	15.50	1897....	34.20
1718....	15.11	1754...	14.48	1790...	15.04	1826...	15.76	1862...	15.35	1898....	35.03
1719....	15.09	1755...	14.68	1791...	15.05	1827...	15.74	1863...	15.37	1899....	34.36
1720....	15.04	1756...	14.94	1792...	15.17	1828...	15.78	1864...	15.37	1900....	33.33
1721....	15.05	1757...	14.87	1793...	15.00	1829...	15.78	1865...	15.44	1901....	34.68
1722....	15.17	1758...	14.85	1794...	15.37	1830...	15.82	1866...	15.43	1902....	39.15

XVIII.—IMPORTS OF GOLD AND SILVER, BY CUSTOMS

[Compiled by the

Customs districts.	GOLD.					
	In ore and base bullion.	Bullion refined.		Coin.		Total gold.
				United States.	Foreign.	
		Ounces.				
Boston and Charlestown, Mass.	$3,000	5,091	$96,054	$1,045	....	$100,099
New York, N. Y	601,890	197,573	4,068,331	583,454	$1,601,767	6,855,442
Passamaquoddy, Me	2,000	15,294	293,451	....	....	295,451
Perth Amboy, N. J	1,556,220	....	....	....	....	1,556,220
Philadelphia, Pa	....	....	....	....	9,003	9,003
Galveston, Tex	2,770	....	....	....	....	2,770
Key West, Fla	....	....	....	....	....	....
Mobile, Ala	....	13	216	2,491	536	3,243
New Orleans, La	26,020	23,220	427,570	20,240	....	473,830
Arizona	247,472	69,471	1,389,410	....	....	1,636,882
Brazos de Santiago, Tex	....	....	....	....	....	....
Corpus Christi, Tex	14,451	109,621	2,267,575	267,689	....	2,549,715
Paso del Norte, Tex	519,750	15,406	306,405	....	....	826,155
Saluria, Tex	....	35,378	705,674	....	....	705,674
Alaska	12,462,890	....	....	1,000	....	12,463,890
Hawaii	....	....	....	....	....	....
Puget Sound, Wash	3,184,340	77,111	1,112,468	81,440	....	4,378,248
San Diego, Cal	4,308	2,250	34,515	....	....	38,823
San Francisco, Cal	1,547,389	27,663	594,766	174,597	7,800,287	10,117,039
Buffalo Creek, N. Y	....	59	1,000	24,975	....	25,975
Cape Vincent, N. Y	....	....	....	1,800	....	1,800
Champlain, N. Y	298,930	....	....	465,990	234,133	999,053
Chicago, Ill	....	....	....	....	243	243
Detroit, Mich	400	111	2,015	1,000	....	3,415
Huron, Mich	....	150	3,000	....	....	3,000
Niagara, N. Y	....	7,927	129,270	750	....	130,020
North and South Dakota	1,001,071	....	....	3,800	2,300	1,007,171
Vermont, Vt	285	50	600	....	....	885
Denver, Colo	9,174	....	....	97	....	9,271
Omaha, Nebr	....	....	....	....	....	....
Total	21,482,360	586,388	11,432,320	1,630,368	9,648,269	44,193,317

DISTRICTS, DURING THE CALENDAR YEAR 1902.

Bureau of Statistics.]

SILVER.					
In ore and base bullion.	Bullion.		Coin.		Total silver.
			United States.	Foreign.	
	Ounces.				
			$400	$591	$991
$2,520,757	1,937,621	$1,162,455	70,139	232,261	3,985,612
9,471,458					9,471,458
				730	730
446,155					446,155
				1,048	1,048
				4,876	4,876
3,925	2,295	1,183		333,169	338,277
787,599	929,255	506,934		27,002	1,321,535
				54,402	54,402
214,028	382,362	214,139		42,235	470,402
1,537,408	1,008,839	553,343		1,894,974	3,985,725
	2,106,960	956,145			956,145
			345		345
				2,150	2,150
1,239,497			79,446		1,318,943
1,279,792	3,281,542	1,797,484	160,193	160,152	3,397,621
	8,244	4,032	90,539		94,571
			39,120		39,120
	10,664	5,598	49,920	250	55,768
	800	400			400
	8,000	4,000	24,190		28,190
126,641			26,655		153,296
456	3,667	1,864	250		2,570
225,105					225,105
47,500					47,500
17,900,321	9,680,249	5,207,577	541,197	2,753,840	26,402,935

XIX.—IMPORTS OF GOLD AND SILVER, BY

[Compiled by the

Countries.	GOLD.					
	In ore and base bullion.	Bullion refined.		Coin.		Total gold.
				United States.	Foreign.	
		Ounces.				
Azores, and Madeira Islands				$36,477		$36,477
France				93,097	$1,447,500	1,540,597
Germany		1	$15			15
Gibraltar				61		61
Portugal				1,965		1,965
United Kingdom	$100	138,778	2,858,838	230	14,112	2,873,280
British Honduras		345	6,078	14,842		20,920
Dominion of Canada:						
Nova Scotia, New Brunswick, etc	2,000	20,395	389,705	1,000		392,705
Quebec, Ontario, etc	9,887,017	8,297	135,885	499,315	236,433	10,758,650
British Columbia	7,293,367	78,953	1,152,101	84,155		8,529,623
Central American States:						
Costa Rica		4,999	104,506	3,000		107,506
Guatemala		245	3,990	407		4,397
Honduras	26,389	4,731	96,148	12,648	969	136,154
Nicaragua	26,020	24,023	448,090	30,462	959	505,531
Salvador	4,166	4,003	84,048		2,102	90,316
Mexico	3,912,642	254,834	5,188,896	335,178	24,323	9,461,039
West Indies:						
British		535	10,964	47,689	77,598	136,251
Cuba	1,000	80	1,660	200	388	3,248
Danish				21,049	819	21,868
Dutch		26	527	59,330	11,963	71,820
French				5,688	229	5,917
Haiti				195,950	100	196,050
Santo Domingo		29	600	34,966	7,952	43,518
Brazil						
Chile	133,185	2,878	61,884	828		195,897
Colombia	3,095	34,504	708,496	5,881	20,087	737,559
Ecuador	64,782	7,047	145,062			209,844
Guiana—Dutch		106	2,181			2,181
Peru	105,823			2,890		108,713
Venezuela	402	1,579	32,646	44,860	2,448	80,356
Chinese Empire				91,600		91,600
East Indies—British				3,500		3,500
Japan	9,289			3,000		12,289
Korea	13,083					13,083
British Australasia					7,791,277	7,791,277
French Oceania				100	9,010	9,110
Philippine Islands						
Total	21,482,360	586,388	11,432,320	1,630,368	9,648,269	44,193,317

COUNTRIES, DURING THE CALENDAR YEAR 1902.

Bureau of Statistics.]

SILVER.					
In ore and base bullion.	Bullion.		Coin.		Total silver.
			United States.	Foreign.	
	Ounces.				
			$473	$1	$474
	237	$142	556		698
			5		5
			376		376
	2,257	1,354	10	2,373	3,737
				282,753	282,753
			1,575	750	2,325
$57,956	31,375	15,894	230,674	250	304,774
1,889,908			79,791		1,969,699
	13,459	8,075			8,075
				10,999	10,999
6,435	622,488	373,322		29,988	409,745
	3,944	2,326	3,413	34,405	40,144
	16,092	9,134	450	290	9,874
15,053,864	8,915,076	4,752,238	1,628	2,337,450	22,145,180
			14,974	32,118	47,092
			152	113	265
			24,066	735	24,801
			3,671	3,467	7,138
			2,081	700	2,781
			14,962	4,059	19,021
25					25
803,525					803,525
166	44,334	26,600	370	2,147	29,283
20	1,200	720			740
88,422	27,953	16,772			105,194
	1,834	1,000	1,777		2,777
			200	1,472	1,672
			6,810	6,850	13,660
			183	2,920	3,103
			153,000		153,000
17,900,321	9,680,249	5,207,577	541,197	2,753,840	26,402,935

XX.—Exports, by Customs Districts and Countries, of Foreign Gold and

[Compiled by the

Customs districts and countries.	GOLD.				
	In ore and base bullion.	Bullion, refined.		Coin.	Total gold.
CUSTOMS DISTRICTS.		*Ounces.*			
Baltimore, Md					
New York, N. Y	$32,000	8,374	$144,025	$1,354,177	$1,530,202
Porto Rico					
Galveston, Tex	250				250
Mobile, Ala					
New Orleans, La					
Corpus Christi, Tex					
Saluria, Tex					
Alaska	131,486	1,441	24,500		155,986
Hawaii				2,500	2,500
San Francisco, Cal					
Champlain, N. Y				233,761	233,761
Detroit, Mich				820	820
Vermont, Vt		10	198		198
Total	163,736	9,825	168,723	1,591,258	1,923,717
COUNTRIES.					
France	32,000			7,334	39,334
Germany				5,900	5,900
Italy					
Spain					
United Kingdom	250	8,374	144,025	6,400	150,675
Bermuda				102,296	102,296
Dominion of Canada:					
Quebec, Ontario, etc		10	198	234,581	234,779
British Columbia	131,486	1,441	24,500		155,986
Central American States:					
Honduras					
Nicaragua					
Mexico					
West Indies:					
British				200	200
Cuba				1,217,400	1,217,400
Santo Domingo					
Brazil				14,647	14,647
Colombia					
Guiana:					
British					
Dutch					
Venezuela					
Chinese Empire					
East Indies, Dutch					
Hongkong					
British Australasia				2,500	2,500
British Oceania					
French Oceania					
Philippine Islands					
Total	163,736	9,825	168,723	1,591,258	1,923,717

SILVER FROM THE UNITED STATES DURING THE CALENDAR YEAR 1902.

Bureau of Statistics.]

SILVER.				
In ore and base bullion.	Bullion.		Coin.	Total silver.
	Ounces.			
....	....	....	$2,516	$2,516
....	1,000	$525	838,969	839,494
....	....	....	797	797
$711	....	....	....	711
....	....	....	5,879	5,879
....	....	....	6,480	6,480
....	....	....	3,000	3,000
....	....	....	44,000	44,000
....	....	....	2,500	2,500
....	....	....	237	237
....	....	....	2,855,614	2,855,614
....	....	....	61,985	61,985
....	....	....	23,135	23,135
....	....	....	47,472	47,472
711	1,000	525	3,892,584	3,893,820
....	....	....	9,700	9,700
....	....	....	....	....
....	....	....	4,000	4,000
....	....	....	797	797
711	1,000	525	347,000	348,236
....	....	....	....	....
....	....	....	132,592	132,592
....	....	....	2,737	2,737
....	....	....	5,638	5,638
....	....	....	12,359	12,359
....	....	....	130,458	130,458
....	....	....	38,201	38,201
....	....	....	500	500
....	....	....	500	500
....	....	....	....	....
....	....	....	201,230	201,230
....	....	....	20,271	20,271
....	....	....	1,784	1,784
....	....	....	160,000	160,000
....	....	....	92,000	92,000
....	....	....	1,000	1,000
....	....	....	2,495,084	2,495,084
....	....	....	....	....
....	....	....	6,340	6,340
....	....	....	5,687	5,687
....	....	....	224,706	224,706
711	1,000	525	3,892,584	3,893,820

XXI.—EXPORTS, BY CUSTOMS DISTRICTS AND COUNTRIES, OF DOMESTIC GOLD

[Compiled by the

Customs districts and countries.	GOLD.				
	In ore and base bullion.	Bullion.			
		United States mint or assay office bars.		Other.	
		Ounces.		*Ounces.*	
CUSTOMS DISTRICTS.					
Baltimore, Md	$1,375				
Bangor, Me					
Boston and Charlestown, Mass					
New York, N. Y	30,375	1,101,899	$22,563,129		
Philadelphia, Pa					
Mobile, Ala					
New Orleans, La					
Corpus Christi, Tex					
Paso del Norte, Tex					
Alaska	1,704				
Hawaii					
Puget Sound, Wash	110,566			225	$4,000
San Francisco, Cal				119,845	2,479,002
Buffalo Creek, N. Y				660	13,628
Cape Vincent, N. Y					
Champlain, N. Y					
Detroit, Mich					
Memphremagog, Vt					
Niagara, N. Y				1,067	20,915
Oswegatchie, N. Y					
Vermont, Vt				44	885
Total	144,020	1,101,899	22,563,129	121,841	2,518,430
COUNTRIES.					
France		917,340	18,767,031		
Germany	26,500	184,559	3,796,098		
Italy					
United Kingdom	5,250				
Dominion of Canada:					
Nova Scotia, New Brunswick, etc					
Quebec, Ontario, etc	1,161			1,771	35,428
British Columbia	111,109			225	4,000
Central American States:					
Costa Rica					
Nicaragua					
Salvador					
Mexico					
West Indies:					
British					
Cuba					
Haiti					
Santo Domingo					
Argentina					
Colombia					
Guiana:					
British					
Dutch					
Peru					
Uruguay					
Venezuela					
Chinese Empire					
East Indies: British					
Hongkong				67	1,446
Japan				119,778	2,477,556
French Oceania					
Total	144,020	1,101,899	22,563,129	121,841	2,518,430

AND SILVER FROM THE UNITED STATES DURING THE CALENDAR YEAR 1902.

Bureau of Statistics.]

GOLD.		SILVER.				
Coin.	Total gold.	In ore and base bullion.	Bullion.		Coin.	Total silver.
			Ounces.			
....	$1,375	$9,325	....	....	$2,505	$11,830
....	....	....	25	$19	....	19
....	....	....	....	....	5,000	5,000
$4,967,204	27,560,708	8,690	67,033,378	35,332,985	140,502	35,482,177
500	500	....	....	....	....	....
700	700	....	....	....	....	....
81,000	81,000	....	....	....	....	....
....	....	....	2,374,198	1,254,657	....	1,254,657
....	....	....	2,385,348	1,359,649	....	1,359,649
1,280	2,984	....	....	....	2,105	2,105
3,390	3,390	....	....	....	....	....
14,529	129,095	25,925	3,276,226	1,658,320	32,655	1,716,900
224,202	2,703,204	....	10,386,714	5,428,408	....	5,428,408
....	13,628	....	122,809	64,807	....	64,807
....	....	....	100	50	....	50
3,363,490	3,363,490	....	....	....	....	....
....	....	....	10,017	5,010	....	6,010
....	....	....	549	305	....	305
....	20,915	....	24,966	13,140	2,100	15,240
....	....	....	37	21	....	21
225,000	225,885	....	56,275	31,956	....	31,956
8,881,295	34,106,874	43,940	85,670,642	45,150,327	184,867	45,379,134
150	18,767,181	....	2,114,845	1,150,741	....	1,150,741
1,125,000	4,947,598	2,550	....	....	900	3,450
....	....	....	....	....	384	384
35,000	40,250	15,465	64,135,232	33,775,693	1,000	33,792,158
....	....	....	25	19	....	19
3,588,490	3,625,079	....	214,753	116,289	3,020	119,309
15,809	130,918	25,925	....	....	33,840	59,765
80,000	80,000	....	50,078	26,100	....	26,100
5,200	5,200	....	....	....	....	....
1,100	1,100	....	....	....	....	....
55,100	55,100	....	4,759,546	2,614,306	....	2,614,306
27,218	27,218	....	....	....	8,595	8,595
4,750	4,750	....	....	....	5,100	5,100
263,198	263,198	....	....	....	150	150
83,974	83,974	....	....	....	128,778	128,778
2,000,000	2,000,000	....	....	....	....	....
4,250	4,250	....	....	....	2,100	2,100
....	....	....	2,778	1,451	1,000	2,451
7,000	7,000	....	....	....	....	....
4,600	4,600	....	....	....	....	....
1,000,000	1,000,000	....	....	....	....	....
354,464	354,464	....	....	....	....	....
....	....	....	390,835	214,200	....	214,200
....	....	....	2,743,410	1,426,340	....	1,426,340
60,012	61,458	....	11,219,140	5,803,238	....	5,803,238
160,380	2,637,936	....	40,000	21,950	....	21,950
5,600	5,600	....	....	....	....	....
8,881,295	34,106,874	43,940	85,670,642	45,150,327	184,867	45,379,134

XXII.—Summary of Imports and Exports of Gold and Silver During the Calendar Year 1902.

[Compiled by the Bureau of Statistics.]

Classification.	Imports.	Exports.		
		Domestic.	Foreign.	Total.
Gold:				
Ore	$21,482,360	$144,020	$163,736	$307,756
Bullion	11,432,320	25,081,559	168,723	25,250,282
United States coin	1,630,368	8,881,295	....	8,881,295
Foreign coin	9,648,269	....	1,591,258	1,591,258
Total	44,193,317	34,106,874	1,923,717	36,030,591
Silver:				
Ore	17,900,321	43,940	711	44,651
Bullion	5,207,577	45,150,327	525	45,150,852
United States coin	541,197	184,867	....	184,867
Foreign coin	2,753,840	....	3,892,584	3,892,584
Total	26,402,935	45,379,134	3,893,820	49,272,954

XXIII.—IMPORTS AND EXPORTS OF THE PRECIOUS METALS OF THE PRINCIPAL COUNTRIES OF THE WORLD.

TABLE SHOWING THE VALUE OF THE GOLD AND SILVER COIN AND BULLION IMPORTED INTO AND EXPORTED FROM THE PRINCIPAL COUNTRIES OF THE WORLD, ALSO THE EXCESS OF IMPORTS OVER EXPORTS OR EXPORTS OVER IMPORTS, FOR A SERIES OF YEARS.

UNITED STATES.

Value of GOLD COIN and BULLION imported into and exported from the United States, fiscal years since 1825.

Year ending—	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
September 30—				
1825	$529,277	$315,672	$213,605	
1826	678,740	1,056,088		$377,348
1827	1,110,448	1,872,489		762,041
1828	808,220	1,635,084		826,864
1829	816,666	1,573,258		756,592
1830	821,146	1,422,664		601,518
1831	932,029	2,979,529		2,047,500
1832	716,686	2,049,406		1,332,720
1833	611,852	889,505		277,653
1834	3,766,172	690,180	3,075,992	
1835	2,325,196	1,355,280	969,916	
1836	7,231,862	647,455	6,584,407	
1837	2,431,814	3,213,735		781,921
1838	11,674,883	1,213,204	10,461,679	
1839	1,164,580	4,800,668		3,636,088
1840	3,085,157	3,703,373		618,216
1841	1,269,449	3,589,869		2,320,420
1842	757,294	2,304,756		1,547,462
June 30—				
1843 [a]	17,066,437	407,687	16,658,750	
1844	1,613,304	1,366,521	246,783	
1845	818,850	3,055,425		2,236,575
1846	910,413	2,053,199		1,142,786
1847	21,574,931	1,037,921	20,537,010	
1848	3,408,755	11,071,197		7,662,442
1849	4,068,647	1,972,233	2,096,414	
1850	1,776,706	4,560,627		2,783,921
1851	3,569,090	22,836,913		19,267,823
1852	3,658,059	40,073,979		36,415,920
1853	2,427,356	25,442,858		23,015,502
1854	3,212,719	40,554,464		37,341,745
1855	1,092,802	55,109,215		54,016,413
1856	990,305	45,000,977		44,010,672
1857	6,654,636	65,232,653		58,578,017
1858	11,566,068	50,002,804		38,436,736
1859	2,125,397	61,108,053		58,982,656
1860	2,508,786	58,446,039		55,937,253
1861	42,291,930	27,423,973	14,867,957	
1862	13,907,011	35,439,903		21,532,892
1863	5,530,538	62,162,838		56,632,300
1864	11,176,769	100,661,634		89,484,865
1865	6,498,228	58,381,033		51,882,805
1866	8,196,261	71,197,309		63,001,048
1867	17,024,866	39,026,627		22,001,761
1868	8,737,443	73,396,344		64,658,901
1869	14,132,568	36,003,498		21,870,930
1870	12,056,950	33,635,962		21,579,012
1871	6,883,561	66,686,208		59,802,647
1872	8,717,458	49,548,760		40,831,302
1873	8,682,447	44,856,715		36,174,268
1874	19,503,137	34,042,420		14,539,283
1875	13,696,793	66,980,977		53,284,184
1876	7,992,709	31,177,050		23,184,341
1877	26,246,234	26,590,374		344,140
1878	13,330,215	9,204,455	4,125,760	
1879	5,624,948	4,587,614	1,037,334	
1880	80,758,396	3,639,025	77,119,371	
1881	100,031,259	2,565,132	97,466,127	
1882	34,377,054	32,587,880	1,789,174	
1883	17,734,149	11,600,888	6,133,261	
1884	22,831,317	41,081,957		18,250,640
Amount carried forward	635,736,973	1,487,123,556	263,383,540	1,114,770,123

[a] Nine months.

Value of GOLD COIN and BULLION imported into and exported from the United States, fiscal years since 1825—Continued.

Year ending—	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
Amount brought forward	$635,736,973	$1,487,123,556	$263,383,540	$1,114,770,123
June 30—				
1885	26,691,696	8,477,892	18,213,804	
1886	20,743,349	42,952,191	....	22,208,842
1887	42,910,601	9,701,187	33,209,414	....
1888	43,934,317	18,376,234	25,558,083	....
1889	10,372,145	60,033,246	....	49,661,101
1890	13,097,146	17,350,193	....	4,253,047
1891	18,516,112	86,462,880	....	67,946,768
1892	50,162,879	50,305,533	....	142,654
1893	22,069,380	108,966,655	....	86,897,275
1894	72,989,563	77,162,228	....	4,172,665
1895	36,384,760	66,502,136	....	30,117,376
1896	33,507,853	112,412,465	....	78,904,612
1897	85,021,992	40,412,151	44,609,841	....
1898	120,402,195	15,533,719	104,868,476	....
1899	88,978,882	37,549,783	51,429,099	....
1900	44,573,184	48,266,759	....	3,693,575
1901	66,051,187	53,185,177	12,866,010	....
1902	52,021,254	48,568,950	3,452,304	....
1903	44,982,027	47,090,595	....	2,108,568
Total	1,529,147,495	2,436,433,530	557,590,571	1,464,876,606

NOTE.—There were no exports of domestic gold previous to 1826, the exports of domestic gold not being separately stated from 1826 to 1861, and in 1863 were included in the exports of domestic silver by the Bureau of Statistics (Statistical Abstracts, 1879–1891). In the Abstracts for 1892–93 this item is omitted entirely, while in the Abstracts for 1894–95 it is included in the gold exports, with the following note appended: "Gold and silver can not be separately stated prior to 1864, but it is probable that the greater portion of the exports was gold."

Value of SILVER COIN and BULLION imported into and exported from the United States, fiscal years since 1821.

Year ending—	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
September 30—				
1821	$8,064,890	$10,478,059	....	$2,413,169
1822	3,369,846	10,810,180	....	7,440,334
1823	5,097,896	6,372,987	....	1,275,091
1824	8,378,970	7,014,552	$1,364,418	....
1825	5,621,488	3,481,383	....	2,859,895
1826	6,202,226	3,648,475	2,553,751	....
1827	7,040,682	6,142,391	898,291	....
1828	6,681,521	6,608,392	73,129	....
1829	6,586,946	3,350,762	3,236,184	....
1830	7,334,818	756,109	6,578,709	....
1831	6,373,916	6,035,402	338,514	....
1832	5,190,818	3,606,934	1,583,884	....
1833	6,458,516	1,722,196	4,736,320	....
1834	14,145,460	1,386,578	12,758,882	....
1835	10,806,251	5,122,495	5,683,756	....
1836	6,169,019	3,676,881	2,492,138	....
1837	8,084,600	2,762,514	5,322,086	....
1838	6,072,233	2,294,842	3,777,391	....
1839	4,430,596	3,976,075	454,521	....
1840	5,797,656	4,713,641	1,084,015	....
1841	3,719,184	6,444,463	....	2,725,279
1842	3,329,722	2,508,783	820,939	....
June 30—				
1843 *a*	5,253,898	1,113,104	4,140,794	....
1844	4,217,125	4,087,693	129,432	....
1845	3,251,392	5,551,070	....	2,299,678
1846	2,867,319	1,852,069	1,015,250	....
1847	2,546,358	869,103	1,677,255	....
1848	2,951,529	4,770,419	....	1,818,890
1849	2,582,593	3,432,415	....	849,822
1850	2,852,086	2,962,367	....	110,281
1851	1,884,413	6,635,839	....	4,751,426
1852	1,846,985	2,600,156	....	753,171
1853	1,774,026	2,044,017	....	269,991
1854	3,726,623	727,040	2,999,583	....
1855	2,567,010	1,138,128	1,428,882	....
1856	3,217,327	744,508	2,472,819	....
1857	5,807,163	3,904,269	1,902,894	....
1858	7,708,428	2,630,343	5,078,085	....
Amount carried forward	200,011,529	152,976,634	74,601,922	27,567,027

a Nine months.

Value of SILVER COIN and BULLION imported into and exported from the United States, fiscal years since 1821—Continued.

Year ending.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
Amount brought forward	$200,011,529	$152,976,634	$74,601,922	$27,567,027
June 30—				
1859	5,309,392	2,779,358	2,530,034	
1860	6,041,349	8,100,200		2,058,851
1861	4,047,681	2,367,107	1,680,574	
1862	2,508,041	1,447,737	1,060,304	
1863	4,053,567	1,993,773	2,059,794	
1864	1,938,843	4,734,907		2,796,064
1865	3,311,844	9,262,193		5,950,349
1866	2,503,831	14,846,762		12,342,931
1867	5,045,609	21,841,745		16,796,136
1868	5,450,925	21,387,758		15,936,833
1869	5,675,308	21,134,882		15,459,574
1870	14,362,229	24,519,704		10,157.475
1871	14,386,463	31,755,780		17,369,317
1872	5,026,231	30,328,774		25,302.543
1873	12,798,490	39,751,859		26,953.369
1874	8,951,769	32,587,985		23,636,216
1875	7,203,924	25,151,165		17,947,241
1876	7,943,972	25 329,252		17,385.280
1877	14,528,180	29,571,863		15,043,683
1878	16,491,099	24,535,670		8,044,571
1879	14,671,052	20,409,827		5,738,775
1880	12,275,914	13,503,894		1,227,980
1881	10,544,238	16,841,715		6,297,477
1882	8,095,336	16,829,599		8,734,263
1883	10,755,242	20,219,445		9,464,203
1884	14,594,945	26,051,426		11,456,481
1885	16,550,627	33,753,633		17,203,006
1886	17,850,307	29,511,219		11,660,912
1887	17,260,191	26,296,504		9,036,313
1888	20,514,232	28,146,510		7,632,278
1889	24,682,380	36,716,783		12,034,403
1890	27,524,147	36,069,602		8,545,455
1891	26,278,916	23,533,551	2,745,365	
1892	28,764,734	33,800,562		5,035,828
1893	34,293,999	41,947,812		7,653,813
1894	19,965,713	51,007,072		31,041,359
1895	20,211,179	47,842,968		27,631,789
1896	27,314,015	60,576,273		33,262,258
1897	30,588,438	63,225,273		32,636,835
1898	30,929,451	55,751,597		24,822,146
1899	31,120,518	56,655,335		25,534,817
1900	35,256,302	56,712,275		21,455,973
1901	36,386,521	64,285,180		27,898,659
1902	28,232,254	49,732,390		21,500,136
1903	24,163,491	44,250,259		20,086,768
Total	916,414,418	1,480,075,812	84,677,993	648,339,387

AUSTRALASIA.

Value of GOLD COIN and BULLION imported into and exported from Australasia since 1851.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1851		$4,365,251		$4,365,251
1852		46,105,221		46,105,221
1853		50,640,799		50,640,799
1854		49,925,424		49,925,424
1855		53,857,556		53,857,556
1856		61,050,243		61,050,243
1857		55,137,445		55,137,445
1858		55,575,430		55,575,430
1859		56,650,927		56,650,927
1860		49,575,036		49,575,036
1861		53,127,581		53,127,581
1862		50,884,124		50,884,124
1863		55,813,889		55,813,889
1864		43,925,029		43,925,029
1865		46,397,211		46,397,211
1866		46,805,997		46,805,997
1867		42,815,467		42,815,467
1868		45,506,642		45,506,642
1869		50,528,870		50,528,870
1870		40,090,227		40,090,227
1871		37,009,733		37,009,733
1872		36,970,801		36,970,801
1873		45,024,858		45,024,858
1874		36,615,546		36,615,546
1875		33,423,122		33,423,122
1876		27,247,534		27,247,534
1877		36,527,949		36,527,949
1878		28,542,023		28,542,023
1879		13,193,081		13,193,081
1880		22,059,845		22,059,845
1881		33,014,336		33,014,336
1882		26,931,211		26,931,211
1883		24,765,619		24,765,619
1884		5,732,737		5,732,737
1885		25,612,390		25,612,390
1886		16,429,304		16,429,304
1887		9,251,217		9,251,217
1888		16,346,574		16,346,574
1889		25,821,649		25,821,649
1890		27,364,330		27,364,330
1891		31,004,472		31,004,472
1892		20,148,254		20,148,254
1893	$15,216,226	24,431,771		9,215,545
1894		26,106,806		26,106,806
1895		25,300,685		25,300,685
1896		27,828,360		27,828,360
1897	26,848,485	85,620,732		58,772,247
1898		62,839,635		62,839,635
1899		65,326,524		65,326,524
Total	42,064,711	1,855,269,467		1,813,204,756

GREAT BRITAIN AND IRELAND.

Value of GOLD COIN and BULLION imported into and exported from Great Britain and Ireland since 1858.

Year.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1858	$110,922,748	$61,157,500	$49,765,248	
1859	108,511,747	87,991,863	20,519,884	
1860	61,243,365	76,119,739		$14,876,374
1861	59,195,799	59,071,387	124,412	
1862	96,861,375	77,922,217	18,939,158	
1863	93,157,779	74,473,407	18,684,372	
1864	82,248,478	64,625,850	17,622,628	
1865	70,494,026	41,332,800	29,161,226	
1866	114,409,668	62,009,230	52,400,438	
1867	76,891,474	38,393,911	38,497,563	
1868	83,393,205	61,845,954	21,547,251	
1869	67,015,657	41,237,256	25,778,401	
1870	91,522,942	48,730,800	42,792,142	
1871	105,208,494	100,728,155	4,480,339	
1872	89,881,539	96,108,100		6,226,561
1873	100,304,234	92,810,092	7,494,142	
1874	87,991,279	51,787,522	36,203,757	
1875	112,614,868	90,751,932	21,862,936	
1876	114,245,832	80,373,888	33,871,944	
1877	75,148,420	99,088,685		23,940,265
1878	101,570,717	72,844,239	28,726,478	
1879	65,058,657	85,547,318		20,488,661
1880	46,012,081	57,564,962		11,552,881
1881	48,484,969	75,425,090		26,940,121
1882	69,963,524	58,513,842	11,449,682	
1883	37,743,601	34,510,128	3,233,473	
1884	52,287,662	58,460,481		6,172,819
1885	65,097,034	58,061,325	7,035,709	
1886	65,173,415	67,078,405		1,904,990
1887	48,447,594	45,373,368	3,074,226	
1888	76,830,297	72,725,672	4,104,625	
1889	87,178,671	70,346,805	16,831,866	
1890	114,693,910	69,623,497	45,070,413	
1891	147,472,002	117,634,800	29,837,202	
1892	103,413,125	75,187,425	28,225,700	
1893	120,978,231	94,959,241	26,018,990	
1894	134,590,674	76,298,306	58,292,368	
1895	176,197,803	104,094,683	72,103,120	
1896	119,664,232	146,628,706		26,964,474
1897	150,648,060	149,970,551	677,509	
1898	230,260,646	178,101,062	52,159,584	
1899	159,544,991	104,907,058	54,637,933	
1900	129,379,007	89,531,234	39,847,773	
1901	104,060,588	67,961,962	36,098,626	
1902	108,450,279	74,988,327	33,461,952	
Total	4,364,464,699	3,512,898,775	990,633,070	139,067,146

Value of SILVER COIN and BULLION imported into and exported from Great Britain and Ireland since 1858.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1858	$32,605,861	$34,366,425		$1,760,564
1859	71,890,166	85,687,697		13,797,531
1860	50,580,026	48,145,209	$2,434,817	
1861	32,036,695	46,588,348		14,551,653
1862	57,194,865	64,793,691		7,598,826
1863	52,987,080	54,702,725		1,715,645
1864	52,691,177	47,947,488	4,743,689	
1865	33,951,823	32,114,968	1,836,855	
1866	52,448,694	43,295,070	9,153,624	
1867	39,033,651	31,318,297	7,715,354	
1868	37,551,948	36,555,717	996,231	
1869	32,752,416	38,463,984		5,711,568
1870	51,823,066	43,341,871	8,481,195	
1871	80,403,841	63,568,150	16,835,691	
1872	54,205,851	51,521,368	2,684,483	
1873	63,206,423	47,828,278	15,378,145	
1874	59,849,039	59,429,489	419,550	
1875	49,268,227	43,699,934	5,568,293	
1876	66,078,646	63,013,067	3,065,579	
1877	105,655,676	94,588,861	11,066,815	
1878	56,215,594	57,025,837		810,243
1879	52,494,269	53,561,156		1,066,887
1880	33,087,441	34,360,804		1,273,363
1881	33,585 673	34,084,878		499,205
1882	44,980,695	43,630,382	1,350,313	
1883	46,076,032	45,369,630	706,402	
1884	46,881,403	48,598,733		1,717,330
1885	45,908,639	47,946,155		2,037,516
1886	36,360,731	35,154,131	1,206,600	
1887	37,853,295	37,994,732		141,437
1888	30,240,139	37,060,480		6,820,341
1889	44,700,749	51,907,607		7,206,858
1890	50,541,810	52,866 658		2,324,848
1891	63,663,246	64,993,889		1,330,643
1892	60,222,938	68,495,988		8,273,050
1893	72,912,463	68,219,872	4,692,591	
1894	65,431,903	60,979,318	4,452,585	
1895	60,428,333	52,209,705	8,218,628	
1896	76,043,209	74,182,191	1,861,018	
1897	94,711,400	91,816,411	2,894,989	
1898	77,006,055	76,984,253	21,802	
1899	66,965,858	68,368,714		1,402,856
1900	69,849,780	66,060,694	3,789,086	
1901	61,141,061	58,640,532	2,500,529	
1902	52,757,722	52,149,988	607,734	
Total	2,456,275,609	2,413,633,375	122,682,598	80,040,364

NOTE.—The imports and exports of gold and silver were not registered at the custom-house before 1858.

INDIA.

Value of GOLD COIN and BULLION imported into and exported from India since 1835.

Fiscal years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1835–36	$1,622,486	$16,940	$1,605,546	
1836–37	2,052,174	9,587	2,042,587	
1837–38	2,251,184	154,355	2,096,829	
1838–39	1,297,073	37,015	1,260,058	
1839–40	1,125,247	22,288	1,102,959	
1840–41	671,012	2,783	668,229	
1841–42	809,591	3,587	806,004	
1842–43	1,033,844	6,229	1,027,615	
1843–44	1,980,850	2,506	1,978,344	
1844–45	3,501,218	45,516	3,455,702	
1845–46	2,686,142	36,450	2,649,692	
1846–47	4,150,341	28,664	4,121,677	
1847–48	5,103,878	47,020	5,056,858	
1848–49	6,821,607	257,097	6,564,510	
1849–50	5,642,940	207,094	5,435,846	
1850–51	5,622,316	9,811	5,612,505	
1851–52	6,515,163	346,324	6,168,839	
1852–53	6,526,532	821,529	5,705,003	
1853–54	5,249,532	84,020	5,165,512	
1854–55	4,295,762	736,939	3,558,823	
1855–56	12,206,900	10,259	12,196,641	
1856–57	10,589,514	412,621	10,176,893	
1857–58	13,772,604	228,779	13,543,825	
1858–59	21,594,310	52,977	21,541,333	
1859–60	20,867,732	18,508	20,849,224	
1860–61	20,645,839	48,042	20,597,797	
1861–62	25,257,767	29,233	25,228,534	
1862–63	33,489,045	162,590	33,326,455	
1863–64	43,434,417	131,912	43,302,505	
1864–65	48,055,743	170,659	47,885,084	
1865–66	31,013,698	3,155,525	27,858,173	
1866–67	22,295,723	3,597,143	18,698,580	
1867–68	23,242,144	810,062	22,432,082	
1868–69	25,193,763	85,768	25,107,995	
1869–70	27,692,321	578,283	27,114,038	
1870–71	13,541,486	2,435,454	11,106,032	
1871–72	17,391,790	41,043	17,350,747	
1872–73	12,761,768	384,496	12,377,272	
1873–74	8,023,918	1,295,311	6,728,607	
1874–75	10,167,256	1,049,709	9,117,547	
1875–76	8,936,648	1,417,358	7,519,290	
1876–77	7,025,824	6,016,755	1,009,069	
1877–78	7,683,847	5,405,698	2,278,149	
1878–79	7,119,933	11,481,159		$4,361,226
1879–80	9,978,237	1,459,398	8,518,839	
1880–81	17,870,070	82,044	17,788,026	
1881–82	23,633,531	60,383	23,573,148	
1882–83	24,795,464	799,390	23,996,074	
1883–84	26,617,111	33,831	26,583,280	
1884–85	23,252,973	516,997	22,735,976	
1885–86	15,044,974	1,599,152	13,445,822	
1886–87	13,789,410	3,194,823	10,594,587	
1887–88	15,748,251	1,185,343	14,562,908	
1888–89	15,179,040	1,485,031	13,694,009	
1889-90	24,678,152	2,217,780	22,460,372	
1890–91	30,794,441	4,095,894	26,698,547	
1891–92	19,511,366	8,077,234	11,434,132	
1892–93	8,440,334	21,764,013		13,323,679
1893–94	10,207,343	8,127,141	2,080,202	
1894–95	5,697,372	21,833,333		16,135,961
1895–96	16,314,949	8,120,760	8,194,189	
1896–97	14,569,385	7,137,257	7,432,128	
1897–98	23,620,284	7,697,146	15,923,138	
1898–99	28,655,136	7,580,080	21,075,056	
1899–1900	37,143,707	6,515,256	30,628,451	
1900–1901	38,601,142	35,868,975	2,732,167	
1901–1902	26,952,409	20,666,059	6,286,350	
1902–1903	42,800,439	14,365,265	28,435,174	
Total	1,054,858,402	226,377,683	862,301,585	33,820,866

NOTE.—Rupee calculated at coining rate, $0.4737, 1835–36 to 1892–93. Rupee calculated at 16 pence=$0.32443328 (India, act of June 26, 1893) from 1893–94. The Indian coinage act, September 15, 1899, made the sovereign equal to 15 rupees. Rupee=$0.3244⅓.

Value of SILVER COIN and BULLION imported into and exported from India since 1835.

Fiscal years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1835-36	$8,923,570	$1,079,278	$7,844,292	
1836-37	8,014,347	1,498,677	6,515,670	
1837-38	10,779,395	1,207,261	9,572,134	
1838-39	13,871,374	998,849	12,872,525	
1839-40	9,426,517	1,394,500	8,032,017	
1840-41	8,309,466	1,488,239	6,821,227	
1841-42	8,166,405	1,921,576	6,244,829	
1842-43	15,743,181	1,375,107	14,368,074	
1843-44	23,085,410	5,101,542	17,983,868	
1844-45	15,456,238	5,778,905	9,677,333	
1845-46	9,252,954	5,006,981	4,245,973	
1846-47	10,156,785	3,449,536	6,707,249	
1847-48	4,487,813	6,892,794		$2,404,981
1848-49	13,619,523	12,091,909	1,527,614	
1849-50	10,880,481	4,682,473	6,198,008	
1850-51	12,927,847	2,624,372	10,303,475	
1851-52	18,070,677	4,126,417	13,944,260	
1852-53	26,718,190	4,287,840	22,430,350	
1853-54	18,349,834	7,128,931	11,220,903	
1854-55	5,572,809	5,428,761	144,048	
1855-56	42,790,127	2,912,201	39,877,926	
1856-57	59,554,743	5,666,786	53,887,957	
1857-58	63,193,118	3,729,608	59,463,510	
1858-59	40,779,771	3,169,795	37,609,976	
1859-60	58,733,428	4,483,813	54,249,615	
1860-61	31,313,981	5,385,269	25,928,712	
1861-62	47,504,340	3,285,374	44,218,966	
1862-63	66,317,742	5,242,194	61,075,548	
1863-64	68,312,034	6,036,407	62,275,627	
1864-65	55,907,812	6,859,332	49,048,480	
1865-66	98,227,383	7,376,154	90,851,229	
1866-67	42,121,504	8,236,064	33,885,440	
1867-68	34,062,580	6,839,866	27,222,714	
1868-69	48,562,804	6,706,037	41,856,767	
1869-70	40,218,703	4,594,463	35,624,240	
1870-71	12,955,596	8,371,840	4,583,756	
1871-72	38,932,000	7,142,562	31,789,438	
1872-73	9,310,588	5,932,750	3,377,838	
1873-74	20,165,316	8,019,505	12,145,811	
1874-75	29,451,085	6,859,818	22,591,267	
1875-76	16,859,016	929,015	15,930,001	
1876-77	48,628,015	13,594,568	35,033,447	
1877-78	76,776,337	5,354,123	71,422,214	
1878-79	27,221,736	7,898,329	19,323,407	
1879-80	46,742,742	8,444,351	38,298,391	
1880-81	25,871,073	6,927,463	18,943,610	
1881-82	31,468,682	5,291,345	26,177,337	
1882-83	40,674,314	4,271,789	36,402,525	
1883-84	36,053,494	4,882,559	31,170,935	
1884-85	44,288,435	9,072,616	35,215,819	
1885-86	60,277,734	3,794,079	56,483,655	
1886-87	40,001,467	5,177,956	34,823,511	
1887-88	51,535,276	6,623,306	44,911,970	
1888-89	52,197,456	7,198,493	44,998,963	
1889-90	60,288,509	7,059,335	53,229,174	
1890-91	73,109,219	5,961,600	67,147,619	
1891-92	50,229,883	7,491,797	42,738,086	
1892-93	72,135,135	11,200,409	60,934,726	
1893-94	49,680,971	5,173,881	44,507,090	
1894-95	25,384,063	4,852,044	20,532,019	
1895-96	27,050,795	5,698,067	21,352,728	
1896-97	27,876,938	8,879,980	18,996,958	
1987-98	42,981,037	15,493,065	27,487,972	
1898-99	29,376,232	16,462,569	12,913,663	
1899-1900	30,901,915	9,297,916	21,603,999	
1900-1901	41,132,184	10,290,338	30,841,846	
1901-1902	39,885,187	16,549,234	23,335,953	
1902-1903	39,340,621	16,967,325	22,373,296	
Total	2,368,195,937	425,251,338	1,945,349,580	2,404,981

NOTE.—Rupee calculated at coining rate, $0.4737, 1835-36 to 1892-93. Rupee calculated at 16 pence=$0.32443328 (India, act of June 26, 1893) from 1893-94. The Indian coinage act, September 15, 1899, made the sovereign equal to 15 rupees. Rupee=$0.3244⅓.

FRANCE.

Value of GOLD COIN and BULLION imported into and exported from France since 1815.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1815–1821 [a]	$424,214,000	$522,837,000		$98,623,000
1822–1836 [a]	1,146,420,000	1,186,950,000		40,530,000
1837–1852 [a]	1,587,232,000	1,198,144,000	$389,088,000	
1853	61,525,891	5,737,504	55,788,387	
1854	92,774,135	12,462,589	80,311,546	
1855	73,515,630	31,394,731	42,120,899	
1856	89,745,193	17,321,364	72,423,829	
1857	109,757,556	23,713,910	86,043,646	
1858	106,837,852	12,826,587	94,011,265	
1859	140,274,330	36,181,131	104,093,199	
1860	90,802,254	30,644,347	60,157,907	
1861	47,099,141	51,679,803		4,580,662
1862	77,552,611	45,700,277	31,852,334	
1863	71,358,469	69,047,101	2,311,368	
1864	89,551,228	65,398,822	24,152,406	
1865	80,944,200	51,835,168	29,109,032	
1866	156,967,479	67,173,843	89,793,636	
1867	114,570,976	35,696,894	78,874,082	
1868	95,234,885	54,152,326	41,082,559	
1869	87,737,028	34,790,566	52,946,462	
1870	59,896,006	36,781,168	23,114,838	
1871	27,765,366	69,031,468		41,266,102
1872	27,379,173	37,587,522		10,208,349
1873	33,889,642	54,856,969		20,967,327
1874	99,789,685	16,558,435	83,231,250	
1875	117,346,702	26,574,749	90,771,953	
1876	115,473,251	18,268,415	97,204,836	
1877	103,196,521	19,099,473	84,097,048	
1878	70,324,568	24,698,596	45,625,972	
1879	37,443,737	69,774,711		32,330,974
1880	37,605,278	78,737,824		41,132,546
1881	45,059,710	43,054,440	2,005,270	
1882	54,703,341	37,068,545	17,634,796	
1883	12,462,010	26,028,752		13,566,742
1884	24,598,043	15,806,983	8,791,060	
1885	47,018,553	38,816,482	8,202,071	
1886	50,354,659	38,233,403	12,121,256	
1887	17,982,216	49,809,821		31,827,605
1888	19,514,968	37,135,702		17,620,734
1889	65,161,124	24,974,151	40,186,973	
1890	22,528,197	48,153,115		25,624,918
1891	69,462,638	45,430,120	24,032,518	
1892	74,379,010	20,837,982	53,541,028	
1893	58,890,873	22,556,169	36,334,704	
1894	88,538,554	20,767,201	67,771,353	
1895	48,872,298	47,165,473	1,706,825	
1896	58,249,195	60,003,829		1,754,634
1897	56,745,469	25,448,764	31,296,705	
1898	38,470,692	60,381,777		21,911,085
1899	61,527,238	31,071,587	30,455,651	
1900	87,416,381	24,254,861	63,161,520	
1901	82,798,158	23,869,468	58,928,690	
1902	85,060,311	24,518,913	60,541,398	
Total	6,644,018,425	4,771,044,831	2,274,918,272	401,944,678

[a] For the periods.

Value of SILVER COIN and BULLION imported into and exported from France since 1815.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1815–1821 [a]	$60,602,000	$74,691,000		$14,089,000
1822–1824 [a]	79,323,000	9,264,000	$70,059,000	
1825–1829 [a]	186,824,000	84,534,000	102,290,000	
1830–1836 [a]	200,527,000	71,410,000	129,117,000	
1837–1852 [a]	515,696,000	202,071,000	313,625,000	
1853	21,725,817	44,284,622		22,558,805
1854	19,270,664	50,863,606		31,592,942
1855	23,331,963	61,383,843		38,051,880
1856	21,209,928	75,949,167		54,739,239
1857	18,965,917	88,411,177		69,445,260
1858	31,002,555	33,885,975		2,883,420
1859	40,633,641	73,737,580		33,103,939
1860	25,206,765	55,554,664		30,347,899
1861	33,230,740	45,160,649		11,929,909
1862	25,368,885	41,999,888		16,631,003
1863	31,073,000	44,262,813		13,189,813
1864	51,672,276	59,869,758		8,197,482
1865	45,574,441	31,565,343	14,009,098	
1866	48,260,036	39,581,791	8,678,245	
1867	49,095,533	12,493,276	36,602,257	
1868	37,260,001	16,169,926	21,090,075	
1869	37,213,102	15,708,077	21,505,025	
1870	20,465,720	13,620,589	6,845,131	
1871	30,337,863	27,343,082	2,994,781	
1872	46,488,682	26,754,432	19,734,250	
1873	75,083,562	40,054,448	35,029,114	
1874	83,842,095	14,181,833	69,660,262	
1875	51,488,926	15,717,920	35,771,006	
1876	39,601,863	12,501,575	27,100,288	
1877	28,594,108	8,143,828	20,450,280	
1878	34,555,492	11,620,530	22,934,962	
1879	26,602,927	11,999,968	14,602,959	
1880	19,487,017	12,000,933	7,486,084	
1881	25,112,195	15,251,246	9,860,949	
1882	24,713,071	30,348,092		5,635,021
1883	15,717,920	18,517,192		2,799,272
1884	19,500,720	8,938,602	10,562,118	
1885	45,505,290	26,581,143	18,924,147	
1886	35,518,423	25,923,836	9,594,587	
1887	34,354,592	26,738,827	7,615,765	
1888	31,669,988	21,021,915	10,648,073	
1889	21,350,913	19,818,847	1,532,066	
1890	26,614,436	20,822,832	5,791,604	
1891	34,030,365	28,055,497	5,974,868	
1892	24,020,020	20,739,863	3,280,157	
1893	31,689,656	24,561,540	7,128,116	
1894	18,326,887	21,201,693		2,874,806
1895	27,227,348	17,163,361	10,063,987	
1896	30,217,696	18,771,262	11,446,434	
1897	36,603,944	50,655,735		14,051,791
1898	36,874,144	36,657,513	216,631	
1899	36,292,338	42,392,673		6,100,335
1900	28,194,516	39,909,728		11,715,212
1901	18,885,436	27,119,395		8,233,959
1902	18,667,732	23,085,502		4,417,770
Total	2,680,703,149	1,991,067,587	1,092,224,319	402,588,757

[a] For the periods.

BELGIUM.

Value of GOLD COIN and BULLION imported into and exported from Belgium since 1852.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1852-1855 *a*	*b* $32,295,892	*b* $44,691,920		$12,396,028
1856-1860 *a*	*b* 61,901,100	*b* 182,089,520		120,188,420
1861-1865 *a*	*b* 36,100,885	*b* 129,583,765		93,482,880
1866-1870 *a*	*b* 72,521,380	*b* 23,035,185	$49,486,195	
1871-1875 *a*	*b* 192,250,550	*b* 17,445,265	174,805,285	
1876-1880 *a*	8,022,250	896,295	7,125,955	
1881	250,740	11,966	238,774	
1882	3,169,602	3,689,539		519,937
1883	476,808	3,227,608		2,750,800
1884	1,302,424	4,037,622		2,735,198
1885	2,950,557	779,767	2,170,790	
1886	2,095,316	522,993	1,572,323	
1887	764,845	34,741	730,104	
1888	1,157,699	66,477	1,091,222	
1889	13,550,148	466,673	13,083,475	
1890	9,202,507	195,444	9,007,063	
1891	356,479	2,517	353,962	
1892	512,378	10,534	501,844	
1893	546,675	32,450	514,225	
1894	3,904,676	325,100	3,579,576	
Total	443,332,911	411,145,381	264,260,793	232,073,263

a For the periods.

b Gold and silver.

Value of SILVER COIN and BULLION imported into and exported from Belgium since 1852.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1852-1855				
1856-1860				
1861-1865				
1866-1870				
1871-1875				
1876-1880 *a*	$30,651,950	$3,763,675	$26,888,275	
1881	4,426,007	3,385,085	1,040,922	
1882	5,897,347	433,119	5,464,228	
1883	16,850,216	3,516,753	13,333,463	
1884	7,116,601	1,890,570	5,226,031	
1885	579,886	62,731	517,155	
1886	2,595,119	168,891	2,426,228	
1887	267,046	175,512	91,534	
1888	1,757,497	760,231	997,266	
1889	10,391,231	1,510,060	8,881,171	
1890	10,595,251	1,179,518	9,415,733	
1891	297,911	13,823	284,088	
1892	333,179	25,379	307,800	
1893	362,453	50,419	312,034	
1894	1,004,219	3,864,205		$2,859,986
Total	93,125,913	20,799,971	75,185,928	2,859,986

a For the period.

SWITZERLAND.

Value of GOLD COIN and BULLION imported into and exported from Switzerland since 1878.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1878	$1,861,375	$1,794,898	$66,477	
1879	2,991,496	864,210	2,127,286	
1880	2,858,541	1,528,987	1,329,554	
1881	2,127,286	664,778	1,462,508	
1882	2,792,063	531,822	2,260,241	
1883	4,985,827	1,263,076	3,722,751	
1884	2,526,152	132,955	2,393,197	
1885[a]	5,553,786	6,199,670		$645,884
1886	2,523,493	1,931,777	591,716	
1887	2,949,615	2,234,979	714,636	
1888	2,877,819	1,879,324	998,495	
1889	6,594,579	1,067,906	5,526,673	
1890	6,118,551	1,226,808	4,891,743	
1891	2,553,554	1,124,854	1,428,700	
1892	4,548,749	1,485,931	3,062,818	
1893	4,802,720	2,120,080	2,682,640	
1894	9,275,749	4,059,069	5,216,680	
1895	7,742,375	4,030,768	3,711,607	
1896	3,727,475	5,093,332		1,365,857
1897	9,210,170	4,484,135	4,726,035	
1898	8,315,572	4,228,718	4,086,854	
1899	8,896,545	6,125,000	2,771,545	
1900	8,856,996	4,015,485	4,841,511	
1901	13,407,332	4,009,891	9,397,441	
1902	10,018,040	5,577,152	4,440,888	
Total	138,115,860	67,675,605	72,451,996	2,011,741

[a] Gold and silver.

Value of SILVER COIN and BULLION imported into and exported from Switzerland since 1878.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1878	$2,985,037	$1,136,544	$1,848,493	
1879	3,040,792	192,998	2,847,794	
1880	5,240,970	471,773	4,769,197	
1881	4,880,707	450,329	4,430,378	
1882	4,696,286	1,518,251	3,178,035	
1883	3,898,561	1,037,901	2,860,660	
1884	2,993,615	802,014	2,191,601	
1885				
1886	5,342,358	3,427,045	1,915,313	
1887	6,187,818	3,589,979	2,597,839	
1888	6,500,132	3,528,862	2,971.270	
1889	8,877,855	2,844,575	6,035,280	
1890	8,522,390	3,843,796	4,678,594	
1891	10,570,093	6,030,421	4,539,672	
1892	7,340,632	5,398,789	1,941,843	
1893	8,076,938	8,760,037		$683,099
1894	6,312,702	6,771,227		458,525
1895	10,835,343	5,025,086	5,810,257	
1896	9,787,265	5,531,494	4,255,771	
1897	14,523,709	7,423,417	7,100,292	
1898	16,657,880	8,307,405	8,350,475	
1899	23,114,229	9,113,377	14,000,852	
1900	17,888,177	6,371,960	11,516,217	
1901	8,429,956	2,278,442	6,151,514	
1902	13,323,559	2,754,094	10,569,465	
Total	210,027,004	96,609,816	114,558,812	1,141,624

ITALY.

Value of GOLD COIN and BULLION imported into and exported from Italy since 1862.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1862 *a*	$29,857	$202,065	....	$172,208
1863 *a*	40,452	77,666	....	37,214
1864 *a*	29,805	36,624	....	6,819
1865 *a*	6,652	143,484	....	136,832
1866 *a*	263,285	905,363	....	642,078
1867 *a*	286,002	1,496,472	....	1,210,470
1868 *a*	281,329	284,426	....	3,097
1869 *a*	291,951	30,309	$261,642	....
1870 *a*	260,668	188,088	72,580	....
1871 *a*	432,786	2,097,918	....	1,665,132
1872 *a*	791,629	953,115	....	161,486
1873 *a*	4,918,051	340,794	4,577,257	....
1874 *a*	1,804,050	1,403,096	400,954	....
1875 *a*	1,619,190	2,198,594	....	579,404
1876 *a*	3,887,505	1,612,785	2,274,720	....
1877 *a*	2,841,419	3,709,674	....	868,255
1878	1,517,775	3,945,680	....	2,427,905
1879	1,824,846	6,411,120	....	4,586,274
1880	2,979,063	3,063,200	....	84,137
1881	14,351,731	3,957,098	10,394,633	....
1882	12,344,261	222,934	12,121,327	....
1883	8,120,475	1,616,124	6,504,351	....
1884	3,942,758	2,271,243	1,671,515	....
1885	2,257,849	19,558,195	....	17,300,346
1886	2,063,595	1,798,760	264,835	....
1887	1,500,479	4,705,456	....	3,204,977
1888	1,432,639	4,372,936	....	2,940,297
1889	3,086,186	3,515,090	....	428,904
1890	1,913,325	3,817,212	....	1,903,887
1891	2,316,000	3,184,500	....	868,500
1892	4,173,109	6,710,037	....	2,536,928
1893	2,899,208	14,954,167	....	12,054,959
1894	3,579,320	4,578,867	....	999,547
1895	1,030,427	3,262,472	....	2,232,045
1896	1,106,006	2,748,610	....	1,642,604
1897	670,521	1,655,052	....	984,531
1898	346,550	2,407,868	....	2,061,318
Total	91,240,754	114,437,094	38,543,814	61,740,154

a Gold and silver.

Value of SILVER COIN and BULLION imported into and exported from Italy since 1878.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1878	$737,937	$5,067,962	....	$4,330,025
1879	997,378	375,020	$622,358	....
1880	4,638,937	2,498,174	2,140,763	....
1881	3,654,990	1,442,156	2,212,834	....
1882	10,703,056	985,155	9,717,901	....
1883	10,037,549	1,919,564	8,117,985	....
1884	1,091,724	3,713,730	....	2,622,006
1885	20,414,016	16,822,841	3,591,175	....
1886	8,809,527	8,845,808	....	36,281
1887	15,676,915	16,622,411	....	945,496
1888	11,504,228	10,194,453	1,309,775	....
1889	6,489,085	7,111,124	....	622,039
1890	9,212,739	9,047,222	165,517	....
1891	8,163,900	8,916,600	....	752,700
1892	10,653,251	12,233,135	....	1,579,884
1893	8,920,296	6,901,927	2,018,369	....
1894	17,358,980	4,433,107	12,925,873	....
1895	432,127	1,655,940	....	1,223,813
1896	1,045,445	1,717,291	....	671,846
1897	1,137,785	3,816,249	....	2,678,464
1898	318,103	2,754,443	....	2,436,340
Total	151,997,968	127,074,312	42,822,550	17,898,894

NOTE.—From 1862 to 1878 silver was included with gold in the reports.

PORTUGAL.

Value of GOLD COIN and BULLION imported into and exported from Portugal since 1869.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1869	$325,712	$136,358	$189,354	
1870	1,232,768	74,264	1,158,504	
1871	3,878,716	48,197	3,830,519	
1872	1,938,875	2,829	1,936,046	
1873	4,221,064	35,527	4,185,537	
1874	1,565,302	42,963	1,522,339	
1875	2,693,037	71,771	2,621,266	
1876	4,671,243	1,786,325	2,884,918	
1877	779,127	1,520,681		$741,554
1878	3,513,650	1,823,424	1,690,226	
1879 *a*	1,343,520	2,838,240		1,494,720
1880	2,779,705	30,489	2,749,216	
1881 *a*	3,248,640	135,000	3,113,640	
1882	2,956,220	2,795,667	160,553	
1883	21,044,080	2,425,351	18,618,729	
1884	2,932,122	295,764	2,636,358	
1885 *a*	4,177,000	847,000	3,330,000	
1886	9,448,364	3,737	9,444,627	
1887	4,762,970	3,123	4,759,847	
1888	4,866,877	572,297	4,294,580	
1889	10,844	2,037	8,807	
1890	15,878,701	11,284,488	4,594,216	
1891	4,018,788	462,988	3,555,800	
1892	1,596,114	9,805,793		8,209,679
1893	1,010,664	6,237,108		5,226,444
1894	3,830	3,891		61
1895	979,274	2,267,537		1,288,263
1896	15,120,000	3,456,000	11,664,000	
1897	18,258	37,794		19,536
1898	70,391	1,101,225		1,030,834
1899	2,553	1,026,233		1,023,680
1900	63,288	1,307,988		1,244,700
1901	1,214,387	1,210,961	3,426	
1902	9,180	751,356		742,176
Total	122,375,267	54,444,406	88,952,508	21,021,647

a Gold and silver.

Value of SILVER COIN and BULLION imported into and exported from Portugal since 1869.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1869	$7,747	$371,232		$363,485
1870	2,984	244,858		241,874
1871	33,026	129,078		96,052
1872	346	41,891		41,545
1873	24,632	39,701		15,069
1874	62,387	76,842		14,455
1875	47,537	54,607		7,070
1876	173,774	30,467	$143,307	
1877	63,818	111,718		47,900
1878	362,572	216,391	146,181	
1879				
1880	47,181	33,035	14,146	
1881				
1882	66,006	16,417	49,589	
1883	500,713	107,888	392,825	
1884	79,669	23,869	55,800	
1885				
1886	637,189	3,886	633,303	
1887	338,959	2,118	336,841	
1888	99,936	102,948		3,012
1889	487	109	378	
1890	495,720	204,984	290,736	
1891	4,911,840	5,338,440		426,600
1892	2,465,264	271,793	2,193,471	
1893		166,536		166,536
1894	298	302		4
1895	255,199	218,933	36,266	
1896	1,537,920		1,537,920	
1897	175,094	*a* 1,651,148		1,476,054
1898	1,579,349	458,175	1,121,174	
1899	967,441	287,245	680,196	
1900	457,596		457,596	
1901	676,733	280,991	395,742	
1902	423,468	406,188	17,280	
Total	16,494,885	10,891,790	8,502,751	2,899,656

a Gold and silver not separated.

NOTE.—1879-1881 and 1885, silver was included with gold in the reports.

AUSTRIA-HUNGARY.

Value of GOLD COIN and BULLION imported into and exported from Austria-Hungary since 1859.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1859	$13,358,460	$9,768,955	$3,589,505	
1860	6,933,771	8,345,382		$1,411,611
1861	6,646,000	6,124,289	521,711	
1862	7,500,011	8,090,176		590,165
1863	10,498,022	8,199,170	2,298,852	
1864	5,677,013	5,940,195		263,182
1865	4,252,111	4,644,889		392,778
1866	6,284,458	5,027,699	1,256,759	
1867	8,491,594	4,383,702	4,107,892	
1868	7,672,142	2,662,388	5,009,754	
1869	13,313,267	3,946,395	9,366,872	
1870	16,115,885	7,217,556	8,898,329	
1871	26,986,083	9,710,471	17,275,612	
1872	15,656,646	5,930,225	9,726,421	
1873	12,380,169	2,108,111	10,272,058	
1874	4,699,387	296,412	4,402,975	
1875	1,998,452	1,609,661	388,791	
1876	10,285,350	2,845,817	7,439,533	
1877	8,671,036	2,758,755	5,912,281	
1878	6,760,976	1,860,880	4,900,096	
1879	10,454,823	1,452,816	9,002,007	
1880	10,562,488	1,516,617	9,045,871	
1881	9,412,065	998,220	8,413,845	
1882	8,411,178	1,995,129	6,416,049	
1883	6,420,701	968,322	5,452,379	
1884	4,745,244	1,384,362	3,360,882	
1885	3,833,413	1,935,980	1,897,433	
1886	3,156,850	451,263	2,705,587	
1887	3,329,646	1,497,344	1,832,302	
1888	10,559,829	4,533,237	6,026,592	
1889	9,958,366	3,468,547	6,489,819	
1890	18,973,001	1,733,941	17,239,060	
1891	17,149,500	4,072,418	13,077,082	
1892	30,107,622	1,153,446	28,954,176	
1893	68,933,160	6,291,269	62,641,891	
1894	22,292,000	18,951,806	3,340,194	
1895	27,645,892	11,617,791	16,028,101	
1896	24,711,754	13,672,619	11,039,135	
1897	42,637,823	20,412,091	22,225,732	
1898	10,663,773	24,984,689		14,320,916
1899	8,585,992	14,245,490		5,659,498
1900	12,918,193	13,629,182		710,989
1901	35,731,855	7,585,753	28,146,102	
1902	37,237,476	14,630,556	22,606,920	
Total	632,613,477	274,654,016	381,308,600	23,349,139

Value of SILVER COIN and BULLION imported into and exported from Austria-Hungary since 1859.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1859	$17,324,743	$22,440,114		$5,115,371
1860	9,300,505	16,127,316		6,826,811
1861	7,386,002	7,573.146		187,144
1862	4,576,629	6,358,763		1,782.134
1863	5,128,338	3,697.136	$1.431,202	
1864	3,229,170	6,193.978		2,964,808
1865	6,416,116	3,637,996	2,778,120	
1866	7,067,029	18,568,343		11,501,314
1867	4,544,544	5,856,469		1,311,925
1868	8,599,096	5,659,682	2,939.414	
1869	6,814,801	2,782,691	4,032,110	
1870	4,621,514	6,210,934		1,589,420
1871	4,225,114	11,361.133		7,136.019
1872	3,148,004	20,579,681		17,431,677
1873	8,224,807	10,153,939		1,929.132
1874	5,130.042	7,379,934		2,249,892
1875	4,950,710	5,693,304		742,594
1876	6,922,317	12,946,813		6,024,496
1877	5,619,826	4,780,771	839,055	
1878	18,478,532	5,524,363	12,954.169	
1879	20,774,473	2,687,560	18,086,913	
1880	3,615,928	8,231,457		4,615,529
1881	7,905,793	651,495	7,254,298	
1882	1,562,781	23,157,024		21,594,243
1883	3,186,613	96,627	3,089,986	
1884	882,859	2,737,890		1,855,031
1885	1,611,073	1,870,907		259,834
1886	1,354,690	12,842	1,341,848	
1887	1,348,456	467,924	880,532	
1888	1,524,255	404,379	1,119,876	
1889	2,040,721	55,940	1,984,781	
1890	1,329,588	44,511	1,285,077	
1891	1,852,808	974,604	878,204	
1892	3,699,472	1,738,086	1,961,386	
1893	3,699,668	1,865,102	1,834,566	
1894	4,729,927	3,073,648	1,656,279	
1895	1,395,736	1,097,257	298,479	
1896	3,032,310	3,470.300		437,990
1897	2,205,065	2,352,442		147,377
1898	434,100	541,351		107,251
1899	686,683	1,738,235		1,051,552
1900	1,066,691	2,246,907		1,180,216
1901	993,975	1,263,382		269,407
1902	3,245,501	4,738,121		1,492,620
Total	215,887,005	249,044,497	66,646,295	99,803,787

NOTE.—The above is at United States silver-dollar coining rate.

GERMANY.

Value of GOLD COIN and BULLION imported into and exported from Germany since 1872.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1872	$8,396,640	$24,247,440	....	$15,850,800
1873	84,252.000	12,598,530	$71,653,470	....
1874	4,176,900	8,353,800	....	4,176,900
1875	3,665,200	6,664,000	....	2,998,800
1876	20,991,600	5,331,200	15,660,400	....
1877	17,374,000	11,067,000	6,307,000	....
1878	40,126,800	333,200	39,793,600	....
1879	20,658,400	1,332,800	19,325,600	....
1880	4,962,300	7,064,554	....	2,102,254
1881	3,350,564	10,863,510	....	7,512,946
1882	6,816,558	9,335,788	....	2,519,230
1883	4,963,252	10,027.416	....	5,064,164
1884	4,384,912	7,873,754	....	3,488,842
1885	10,127,138	5,837,664	4,289,474	....
1886	11,152,204	5,522,790	5,629,414	....
1887	13,193,054	3,993,878	9,199,176	....
1888	31,943,646	23,868,544	8,075,102	....
1889	17,375,404	13,678,146	3,697,258	....
1890	26,471,145	10,816,886	15,654,259	....
1891	56,647,846	31,689,457	24,958,389	....
1892	45,612,162	38,897,709	6,714,453	....
1893	35,551,259	24,175,031	11,376,228	....
1894	74,130,690	12,689,947	61,440 743	....
1895	23,193,328	19,574,609	3 618 719	....
1896	52,421,909	47,000,480	5,421,429	....
1897	36,822,654	28,239,437	8,583,217	....
1898	77,637,405	52,780,811	24,856,594	....
1899	64,563,395	32,307,398	32,255,997	....
1900	57,415,834	27,098,680	30,317,154	....
1901	61,126,228	12,278,509	48,847,719	....
1902	33,077,957	25,233,161	7,844,796	....
Total	952,582,384	530,776,129	465,520,191	43,713,936

Value of SILVER COIN and BULLION imported into and exported from Germany since 1872.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1872	$40,698,000	$17,157,420	$23,540,580	....
1873	35,057,400	31,915,800	3,141,600	....
1874	12,052,320	17,080,308	....	$5,027,988
1875	7,216,160	9,253,440	....	2,037,280
1876	5,483,520	8,409,492	....	2,925,972
1877	7,106,680	4,678,128	2,428,552	....
1878	9,520,000	6,645,912	2,874,088	....
1879	7,794,500	9,567,600	....	1,773,100
1880	4,366,348	5,017,992	....	651,644
1881	3,142,790	4,165,714	....	1,022,924
1882	1,551,284	3,418,156	....	1,866,872
1883	1,502,018	4,917,556	....	3,415,538
1884	1,356,838	7,468,202	....	6,111,364
1885	710,906	4,618,866	....	3,907,960
1886	2,310,980	10,141,894	....	7,830,914
1887	2,060,842	9,063,278	....	7,002,436
1888	2,603,958	11,056,290	....	8,452,332
1889	2,254,669	13,934,329	....	11,679,660
1890	3,141,743	13,442,240	....	10,300,497
1891	4,056,672	13,166,707	....	9,110,035
1892	3,904,687	3,029,225	875,462	....
1893	2,464,328	11,894,183	....	9,429,855
1894	4,251,407	8,450,850	....	4,199,443
1895	2,389,088	5,547,817	....	3,158,729
1896	3,163,429	7,260,925	....	4,097,496
1897	3,177,552	7,670,089	....	4,492,537
1898	2,657,135	7,445,693	....	4,788,558
1899	2,310,815	5,920,626	....	3,609,811
1900	3,979,122	6,392,204	....	2,413,082
1901	4,479,537	6,981,803	....	2,502,266
1902	5,389,510	6,830,176	....	1,440,666
Total	192,154,238	282,542,915	32,860,282	123,248,959

NETHERLANDS.

Value of GOLD COIN and BULLION imported into and exported from the Netherlands since 1851.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1851-1855 *a*	*b* $22,655,250	*b* $20,375,265	$2,279,985	....
1856-1860 *a*	*b* 34,469,490	26,990,020	7,479,470	....
1861-1865 *a*	*b* 26,803,655	*b* 36,969,725	....	$10,166,070
1866-1870 *a*	*b* 42,527,210	*b* 26,139,410	16,387,800	....
1871-1875 *a*	*b* 50,747,505	*b* 18,602,135	32,145,370	....
1876-1880 *a*	22,539,255	4,538,920	18,000,335	....
1881	2,668,641	3,183,004	....	514,363
1882	4,014,018	1,852,411	2,161,607	....
1883	11,393,703	308,645	11,085,058	....
1884	5,658,021	805,809	4,852,212	....
1885	6,595,534	421,963	6,173,571	....
1886	11,212,074	770,212	10,441,862	....
1887	1,248,992	603	1,248,389	....
1888	3,766,457	5,553,435	....	1,786,978
1889	988,855	822.894	165,961	....
1890	2,623,952	228,158	2,395,794	....
1891	3,707,284	891,636	2,815,648	....
1892	852,155	97,464	754,691	....
1893	7,044,546	943,333	6,101,213	....
1894	3,258,790	263,713	2,995,077	....
1895	1,385,000	305,124	1,079,876	....
1896	1,956,695	84,098	1,872,597	....
1897	8,568,577	33,338	8,535,239	....
1898	12,645,380	427,908	12,217,472	....
1899	3,789,213	2,911,336	877,877	....
1900	6,757,901	733,004	6,024,897	....
1901	4,207,059	691,806	3,515,253	....
1902	3,118,344	1,739,961	1,378,383	....
Total	307,203,556	156,685,330	162,985,637	12,467,411

a For the periods. *b* Gold and silver.

Value of SILVER COIN and BULLION imported into and exported from the Netherlands since 1851.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1851-1855	....	....	....	....
1856-1860	....	....	....	....
1861-1865	....	....	....	....
1866-1870	....	....	....	....
1871-1875	....	....	....	....
1876-1880 *a*	$13,273,625	$8,520,980	$4,752,645	....
1881	976,851	19,507	957,344	....
1882	1,061,238	26,745	1,034,493	....
1883	926,065	111,256	814,809	....
1884	706,709	425,125	281,584	....
1885	950,119	286,444	663,675	....
1886	572,811	11,619	561,192	....
1887	309,492	47,430	262,062	....
1888	387,338	1,631,316	....	$1,243,978
1889	264,797	6,668,657	....	6,403,860
1890	551,823	3,083,943	....	2,532,120
1891	4,802,292	625,512	4,176,780	....
1892	5,255,793	2,241,753	3,014,040	....
1893	951,392	318,143	633,249	....
1894	2,466,758	630,403	1,836,355	....
1895	1,128,354	22,310	1,106,044	....
1896	639,381	247,981	391,400	....
1897	1,058,263	3,922	1,054,341	....
1898	502,864	640,320	....	137,456
1899	379,277	3,305,086	....	2,925,809
1900	298,235	742,691	....	444,456
1901	3,278,008	889,557	2,388,451	....
1902	2,628,573	101,976	2,526,597	....
Total	43,370,058	30,602,676	26,455,061	13,687,679

a For the period.

SPAIN.

Value of GOLD and SILVER COIN and BULLION imported into and exported from Spain since 1871.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1871	$20,765,642	$1,648,799	$19,116,843	
1872	20,538,288	482,886	20,055,402	
1873	20,342,972	1,229,796	19,113,176	
1874	12,228,866	1,245,236	10,983,630	
1875	17,800,197	832,988	16,967,209	
1876	2,318,123	820,636	1,497,487	
1877	9,505,250	402.019	9,103,231	
1878	7,504,226	441,198	7,063,028	
1879	6,577,247	590,773	5,986,474	
1880	17,241,848	2,458,048	14,783,800	
1881	2,021,289	1,252,570	768,719	
1882	7,896,981	1,370,879	6,526,102	
1883	9,502.355	1,399,057	8,103,298	
1884	8,718,196	458,375	8,259,821	
1885	5,243,810	1,888,119	3,355,691	
1886	12,131,787	509,327	11,622,460	
1887	3,861,158	886,642	2,974,516	
1888	546,383	820,250		$273,867
1889	2,611,869	2.555,706	56,163	
1890	8,359,988	1,027,918	7,332,070	
1891	22,661,095	4,028,875	18,632,220	
1892	8,948,997	8,380,253	568,744	
1893	5,026,068	2,528,135	2,497,933	
1894	4,866,595	690,223	4,176,372	
1895	4,680,687	8,142,978		3,462,291
1896	19,659,369	23,892,671		4,233,302
1897	26,984,769	32,931,362		5,946,593
1898	13,730,792	4,121,534	9,609,258	
1899	14,808,815	4,038,695	10,770,120	
1900	1,065,221	4,063,570		2,998,349
1901 *a*				
1902	2,385,851	2,875,763		489,912
Total	320,534,734	118,015,281	219,923,767	17,404,314

a No returns.

SCANDINAVIAN UNION.

Value of GOLD and SILVER COIN and BULLION imported into and exported from Norway, Sweden, and Denmark since 1871.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1871 *a*	$2,896,008	$558,780	$2,337,228	
1872 *a*	3,461,220	30,284	3,430,936	
1873 *a*	7,014,364	4,843,832	2,170,532	
1874 *a*	3,424,772	2,234,584	1,190,188	
1875	5,966,484	3,348,928	2,617,556	
1876	10,659,432	10,956,644		$297,212
1877	6,223,496	4,402,007	1,821,489	
1878	6,982,472	3,091,916	3,890,556	
1879	9,207,944	5,361,876	3,846,068	
1880	7,203,572	2,399,940	4,803,632	
1881	4,036,884	3,252,448	784,436	
1882	3,152,484	2,179,108	973,376	
1883	4,043,852	1,836,068	2,207,784	
1884	2,927,096	1,079,236	1,847,860	
1885	2,379,481	1,813,154	566,327	
1886	2,519,987	322,813	2,197,174	
1887 *b*	4,959,684	2,387,880	2,571,804	
1888 *b*	1,656,650	705.486	951,164	
1889	2,911,368	1,353,802	1,557,566	
1890	1,374,770	746,136	628,634	
1891	1,966,988	933,893	1,033,095	
1892	1,672,238	389,821	1,282,417	
1893	657,388	953,819		296,431
1894	3,073,305	781,238	2,292,067	
1895	3,329,967	654,459	2,675,508	
1896	780,620	1,407,293		626,673
1897	2,956,106	92,743	2,863,363	
1898	5,099,397	627,724	4,471,673	
1899	1,501,952	1,365,933	136,019	
1900	357,445	900,078		542,633
1901	2,322,175		2,322,175	
1902	297,981	402,000		104,019
Total	117,017,582	61,413,923	57,470,627	1,866,968

a Exclusive of imports and exports of Denmark. *b* Exclusive of imports and exports of Norway.

RUSSIA.

Value of GOLD COIN and BULLION imported into and exported from Russia since 1871.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1871	$4,897,071	$13,013,320		$8,116,249
1872	6,260,070	4.992.774	$1,267,296	
1873	1,929,500	11,043.686		9,114,186
1874	5,056,834	13,162,277		8,105,443
1875	1,328,268	21,283,157		19,954,889
1876	1,148,438	78,603 971		77,455,533
1877	7,257,235	10,490,306		3,233,071
1878	7,910,178	5,252,871	2,657,307	
1879	5,702,058	4,493,420	1,208,638	
1880	5,438,103	19,971,097		14,532,994
1881	4,145,338	51,652,715		47,507,377
1882	3,464,610	52,957,057		49,492,447
1883	2,326,205	14,827,822		12,501,617
1884	1,861,582	3,884,469		2,022,887
1885	1,921,010	4,118,325		2,197,315
1886	1,853,092	11,031,337		9,178,245
1887	1,691,014	14,579,302		12,888,288
1888	16,213,203	27,013,772		10,800,569
1889	2,074,598	13,468,682		11,394,084
1890	12,195,212	13,054,997		859,785
1891	55,818,120	475,429	55,342,691	
1892	89,497,054	195,956	89,301,098	
1893	10,225,426	134,454	10,090,972	
1894	84,527,216	29,085,329	55,441,887	
1895	19,486,233	185,070	19,301,163	
1896	69,720,678	180,715	69,539,963	
1897	71,871,436	3,084,139	68,787,297	
1898	52,154,937	185,070	51,969,867	
1899	25,532,051	27,771,673		2,239,622
1900	2,636,576	59,877,804		57,242,228
1901	4,460,206	34,874,304		30,414,098
1902	4,259,528	445,094	3,814,434	
Total	584,862,080	545,390,394	428,722,613	389,250,927

Value of SILVER COIN and BULLION imported into and exported from Russia since 1871.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1871	$830,457	$628,245	$202,212	
1872	3,803,430	969,381	2,834,049	
1873	13,932,534	273,989	13,658,545	
1874	7,778,200	341,136	7,437,064	
1875	3,642,896	354,256	3,288,640	
1876	3,038,577	1,087,466	1,951,111	
1877	1,193,975	4,367,616		$3,173,641
1878	4,842,273	5,672,730		830,457
1879	5,697,428	3,369,679	2,327,749	
1880	4,124,499	2,240,535	1,883,964	
1881	3,530,985	1,592,223	1,938,762	
1882	4,078,963	9,110,327		5,031,364
1883	2,732,944	2,115,504	617,440	
1884	2,654,220	1,779,771	874,449	
1885	3,323,371	2,479,793	843,578	
1886	3,669,137	1,880,877	1,788,260	
1887	3,143,541	2,235,133	908,408	
1888	1,471.051	3,127,334		1,656,283
1889	6,541,777	2,333,151	4,208,626	
1890	5.693,569	3,101,864	2,591,705	
1891	8,145,577	4,131,445	4,014,132	
1892	9,019,503	4,157,443	4,862,060	
1893	17,570,074	6,190,134	11,379,940	
1894	19,076,853	5,844,742	13,232,111	
1895	21,536,271	1,762,512	19,773,759	
1896	41,498,492	2,708,233	38,790,259	
1897	76,659,089	7,333,495	69,325,594	
1898	15,336,033	2,262,788	13,073,245	
1899	16,396,290	1,038,307	15,357,983	
1900	14,891,366	9,233,264	5,658,102	
1901	4,818,854	1,905,930	2,912,924	
1902	3,149,622	3,212,398		62,776
Total	333,821,851	98,841,701	245,734,671	10,754,521

JAPAN.

Value of GOLD COIN and BULLION imported into and exported from Japan since 1872.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1872	$129,951	$2,684,786	....	$2,554,835
1873	2,013,907	2,614,055	....	600,148
1874	2,700	8,126,290	....	8,123,590
1875	26,515	10,603,345	....	10,576,830
1876	621,464	5,872,356	....	5,250,892
1877	162,280	6,221,776	....	6,059,496
1878	242	4,601,083	....	4,600,841
1879	913,392	5,694,814	....	4,781,422
1880	137,934	7,030,479	....	6,892,545
1881	468,530	2,699,941	....	2,231,411
1882	530,132	1,489,983	....	959,851
1883	564,212	1,211,483	....	647,271
1884	326,600	1,708,384	....	1,381,784
1885	608,919	599,539	$9,380	....
1886	1,165,237	377,149	788,088	....
1887	1,259,527	111,874	1,147,653	....
1888	1,203,253	450,285	752,968	....
1889	749,923	268,010	481,913	....
1890	360,243	1,687,605	....	1,327,362
1891	283,144	230,446	52,698	....
1892	395,493	8,544,523	....	8,149,030
1893	496,730	2,302,678	....	1,805,948
1894	555,966	3,547,138	....	2,991,172
1895	1,029,912	2,791,952	....	1,762,040
1896	10,217,458	1,996,575	8,220,883	....
1897	32,156,796	4,431,899	27,724,897	....
1898	18,456,372	23,068,797	....	4,612,425
1899	10,009,163	4,370,565	5,638,598	....
1900	4,469,252	25,797,991	....	21,328,739
1901	5,308,563	5,720,562	....	411,999
1902	15,043,541	225,930	14,817,611	....
Total	109,667,351	147,082,293	59,634,689	97,049,631

Value of SILVER COIN and BULLION imported into and exported from Japan since 1872.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1872	$3,695,570	$2,976,127	$719,443	....
1873	1,066,635	2,508,862	....	$1,442,227
1874	1,069,041	5,688,911	....	4,619,870
1875	271,806	4,060,626	....	3,788,820
1876	7,545,776	4,803,344	2,742,432	....
1877	2,011,217	3,219,494	....	1,208,277
1878	2,188,858	2,727,569	....	538,711
1879	2,414,046	8,029,229	....	5,615,183
1880	3,670,515	7,334,822	....	3,664,307
1881	1,902,506	5,243,660	....	3,341,154
1882	6,515,345	3,184,162	3,331,183	....
1883	6,016,878	2,146,995	3,869,883	....
1884	5,930,581	3,581,418	2,349,163	....
1885	8,031,835	3,763,809	4,268,026	....
1886	9,382,875	9,323,906	58,969	....
1887	9,743,844	10,949,251	....	1,205,407
1888	7,529,239	7,383,159	146,080	....
1889	13,423,322	4,920,519	8,502,803	....
1890	840,364	12,090,926	....	11,250,562
1891	13,605,382	1,222,518	12,382,864	....
1892	22,488,264	1,185,230	21,303,034	....
1893	10,689,757	9,986,510	703,247	....
1894	26,227,687	30,831,973	....	4,604,286
1895	4,844,252	24,509,747	....	19,665,495
1896	28,924,750	9,602,307	19,322,443	....
1897	8,576,610	5,147,733	3,428,877	....
1898	2,759,417	20,289,853	....	17,530,436
1899	41,274	1,199,200	....	1,157,926
1900	1,271,237	2,464,809	....	1,193,572
1901	154,255	1,281,509	....	1,127,254
1902	985,680	785,223	200,457	....
Total	213,818,818	212,443,401	83,328,904	81,953,487

CHINA.

Value of GOLD COIN and BULLION imported into and exported from China since 1881.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1881	$32,812,230	$19,935,880	$12,876,350	
1882	32,197,337	21,424,176	10,773,161	
1883	34,653,579	29,756,403	4,897,176	
1884	7,349,653	21,132,426		$13,782,773
1885	63,599,002	115,539,656		51,940,654
Total	170,611,801	207,788,541	28,546,687	65,723,427

Value of SILVER COIN and BULLION imported into and exported from China since 1881.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1881	$33,119,846	$24,725,684	$8,394,162	
1882	51,809,679	37,342,013	14,467,666	
1883	30,473,767	23,241,947	7,231,820	
1884	34,514,153	24,133,372	10,380,781	
1885	27,700,467	34,278,347		$6,577,880
Total	177,617,912	143,721,363	40,474,429	6,577,880

NOTE.—The above is United States silver-dollar coining value.

MEXICO.

Value of GOLD and SILVER COIN and BULLION imported into and exported from Mexico since 1879.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1879		$21,835,872		$21,835,872
1880		22,388,576		22,388,576
1881		19,567,144		19,567,144
1882		17,337,024		17,337,024
1883		30,103,064		30,103,064
1884		34,008,568		34,008,568
1885		34,314,384		34,314,384
1886		30,384,496		30,384,496
1887		34,097,976		34,097,976
1888		31,502,096		31,502,096
1889		39,405,560		39,405,560
1890		41,847,008		41,847,008
1891		20,912,328		20,912,328
1892		49,250,763		49,250,763
1893		51,769,745		51,769,745
1894		47,320,215		47,320,215
1895		56,781,075		56,781,075
1896		44,919,693		44,919,693
1897		77,877,391		77,877,391
1898	1,189,174	74,999,509		73,810,335
1899		65,533,961		65,533,961
1900		86,933,639		86,933,639
1901	2,279,875	60,028,200		57,748,325
1902	3,457,994	79,458,153		76,000,159
Total	6,927,043	1,072,576,440		1,065,649,397

NOTE.—The above is United States silver-dollar coinage value.

ARGENTINA.

Value of GOLD and SILVER COIN and BULLION imported into and exported from Argentina since 1881.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1881	$4,180,324	$3,007,497	$1,172,827	
1882	2,700,908	2,238,590	462,318	
1883	2,369,986	4,774,037		$2,404,051
1884	4,778,903	4,389,583	389,320	
1885	6,136,657	8,219,519		2,082,862
1886	20,084,046	8,136,788	11,947,258	
1887	9,489,675	9,611,338		121,663
1888	43,613,573	8,501,776	35,111,797	
1889	11,436,275	27,670,919		16,234,644
1890	7,088,401	775,529	6,312,872	
1891	9,007,891	1,659,476	7,348,415	
1892	6,510,898	1,974,477	4,536,421	
1893	4,524,885	1,910,700	2,614,185	
1894	3,186,952	264,067	2,922,885	
1895	4,730,000	119,000	4,611,000	
1896	6,063,345	2,179,000	3,884,345	
1897	671,000	4,949,000		4,278,000
1898	7,298,901	1,572,772	5,726,129	
1899	10,202,854	3,526,032	6,676,822	
1899	10,202,854	3,526,032	6,676,822	
1900	2,383,120	2,376,270	6,850	
Total	166,458,594	97,856,370	93,723,444	25,121,220

CHILE.

Value of GOLD and SILVER COIN and BULLION imported into and exported from Chile since 1873.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1873	$1,547,547	$5,007,629		$3,460,082
1874	126,529	4,326,319		4,199,790
1875	345,522	6,535,710		6,190,188
1876	330,922	5,061,160		4,730,238
1877	321,189	1,771,406		1,450,217
1878	180,060	1,854,137		1,674,077
1879	53,531	2,501,381		2,447,850
1880	43,799	4,676,707		4,632,908
1881	116,796	2,949,099		2,832,303
1882	29,199	3,990,530		3,961,331
1883	345,521	6,647,639		6,302,118
1884	58,398	6,214,521		6,156,123
1885	155,728	7,620,939		7,465,211
1886	311,456	7,509,010		7,197,554
1887	87,597	9,105,222		9,017,625
1888	199,527	8,895,962		8,696,435
1889	452,585	6,117,190		5,664,605
1890	199,527	5,645,140		5,445,613
1891	116,796	5,353,150		5,236,354
1892	162,336	5,713,680		5,551,344
1893	314,000	5,917,000		5,603,000
1894	272,524	5,635,407		5,362,883
1895	11,217,505	6,437,865	$4,779,640	
1896	95,000	5,800,000		5,705,000
1897	41,000	4,887,000		4,846,000
Total	17,124,594	136,173,803	4,779,640	123,828,849

Value of GOLD COIN and BULLION imported into and exported from Chile.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1898		$4,591,045		$4,591,045
1899	$2,798	1,826,461		1,823,663
1900		1,029,300		1,029,300
1901		448,489		448,489

Value of SILVER COIN and BULLION imported into and exported from Chile.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1898		$4,061,272		$4,061,272
1899		1,531,409		1,531,409
1900		1,114,643		1,114,643
1901		996,668		996,668

CAPE COLONY.

Value of GOLD COIN and BULLION imported into and exported from Cape Colony since 1825.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1825–1865 *a*	$16,606,980	$5,196,147	$11,410,833	
1866	48,665	57,872		$9,207
1867	170,327	93,252	77,075	
1868	488,363	57,989	430,374	
1869	121,662	195,448		73,786
1870	968,433	140,505	827,928	
1871	3,220,333	252,143	2,968,190	
1872	8,848,416	303,830	8,544,586	
1873	1,511,389	485,087	1,026,302	
1874	810,608	1,211,680		401,072
1875	95,758	880,705		784,947
1876	1,303,682	659,747	643,935	
1877	1,376,129	127,721	1,248,408	
1878	2,123,575	372,029	1,751,546	
1879	2,825,811	1,274,774	1,551,037	
1880	1,798,171	716,436	1,081,735	
1881				
1882	1,290,737	249,233	1,041,504	
1883				
1884				
1885	979,914	1,893,818		913,904
1886	842,391	871,970		29,579
1887	3,339,378	228,580	3,110,798	
1888		2,516,569		2,516,569
1889		12,685,544		12,685,544
1890	3,649,875	9,132,849		5,482,974
1891		12,115,726		12,115,726
1892	837	20,927,541		20,926,704
1893		25,915,276		25,915,276
1894	1,143,628	35,838,390		34,694,762
1895	27,349,779	40,654,318		13,304,539
1896	3,990,530	38,944,434		34,953,904
1897	487	66,288,232		66,287,745
1898		81,606,323		81,606,323
1899	20,563,659	73,068,702		52,505,043
1900	8,663,158	1,842,583	6,820,575	
1901	1,461,045	9,549,450		8,088,405
1902	106,070	38,672,606		38,566,536
Total	115,699,790	485,027,509	42,534,826	411,862,545

a For the period.

Value of SILVER COIN and BULLION imported into and exported from Cape Colony since 1825.

Years.	Imports.	Exports.	Excess of imports over exports.	Excess of exports over imports.
1825–1865 *a*	$1,367,389	$587,240	$780,149	
1866		9,387		$9,387
1867		9,991		9,991
1868	487	8,331		7,844
1869		6,395		6,395
1870		23,554		23,554
1871	52,072	12,531	39,541	
1872	837,524	49,940	787,584	
1873	164,716	18,186	146,530	
1874		30,182		30,182
1875	56,680	23,130	33,550	
1876	26,016	7,504	18,512	
1877	74,477	10,375	64,102	
1878	2,998	501	2,497	
1879	15,621	638	14,983	
1880	278,899	3,100	275,799	
1881				
1882	109,594	17,734	91,860	
1883				
1884				
1885	89,329	202,285		112,956
1886	2,433	127,176		124,743
1887	239,485	82,794	156,691	
1888				
1889				
1890	297,830	35,263	262,567	
1891	51,098	768	50,330	
1892	20,488	429,164		408,676
1893	228,725	452,122		223,397
1894	529,047	344,383	184,664	
1895	386,463	243,082	143,381	
1896	806,184	65,440	740,744	
1897	297,479	159,529	137,950	
1898	476,722	164,507	312,215	
1899	450,930	232,916	218,014	
1900	1,526,067	37,214	1,488,853	
1901	902,512	26,829	875,683	
1902	811,888	3,533	808,355	
Total	10,103,153	3,425,724	7,634,554	957,125

a For the period.

XXIV.—COINAGE OF NATIONS.

Country.	1900.		1901.		1902.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
United States	$99,272,943	$36,345,321	$101,735,187	$30,838,461	$47,184,933	$48,188,944
Abyssinia		50		94,059		
Arabia		2,044				2,044
Austria-Hungary	3,575,517	13,284,093	3,817,524	3,604,414	5,708,431	7,569,740
Lichtenstein						
Belgium				579,000		
Bolivia				2,450,218		
Brazil					9,828	
British Empire:						
Australasia	48,782,482		48,228,115		55,541,989	
British Guiana		3,650		4,867		
Canada		589,000		420,000		354,000
Ceylon		97,330				133,320
Cyprus		316,323				
Great Britain	63,769,609	10,107,818	12,672,366	4,187,662	34,644,614	5,352,615
Honduras				10,000		10,000
Hongkong		14,919,991		30,248,656		33,571,117
India		[a] 56,013,002		[a] 16,658,916		36,951,286
Mauritius						
Newfoundland		100,000				
Sarawak		60,000				
Straits Settlements		800,000		600,000		750,000
Colombia						460,000
Costa Rica	1,047,041					
Crete				366,700		
Denmark	1,082,870	80,788				
Ecuador	243,325	23,359				49,023
Egypt		605,544		367,867		
France	5,799,424	1,099,421	14,451,668	2,393,200	9,432,709	2,294,594
French colonies:						
Indo-China		14,620,957		3,876,984		4,936,448
Tunis	579,232	347	579,232		232	347
Germany	34,680,396	5,645,281	28,149,252	7,148,713	20,887,289	10,497,126
Colony of German East Africa		111,183		243,492		67,115
Guatemala				3,000		
Italy		157,767		516,755	22,851	1,000,161
Colony of San Marino			(b)	(b)		
Japan	5,567,128	1,295,850	988,264	536,025	15,101,520	315,144
Korea				298,800		210,403
Mexico	568,825	17,097,050	625,798	21,821,900	816,078	24,687,100
Monaco			295,116			
Morocco		430,939		117,084		338,506
Netherlands	804,342	1,236,150	465,807	1,376,850		220,100
Netherlands colonies:						
Curaçao		48,240		12,060		
Dutch East Indies		556,770		402,000		
Norway		134,000		160,800	336,729	230,748
Persia			3,323	4,698,055	13,942	7,900,783
Peru	309,183	109,575	395,427	74,240	449,402	33,221
Portugal		648,000		611,506		
Russia	[c] 83,221,525	[c] 3,946,971	[c] 31,527,256	[c] 3,681,185	26,447,649	3,323,037
Santo Domingo						
Siam		263,473		85,687		2,551,929
Spain	3,188,055	3,801,852	(b)	(b)		501,606
Sweden	558,507	101,517	1,932,915	72,603	510,022	135,827
Switzerland	1,544,000	147,645	1,930,000	115,800	2,316,000	
Turkey	342,093	7,852	296,537	8,335	880,907	686,300
Venezuela		546,003		225,997		392,778
Total	354,936,497	185,358,156	248,093,787	138,911,891	220,405,125	193,715,362

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[a] Fiscal year rupee calculated at $0.3244.
[b] No returns.
[c] Ruble calculated at coining rate, $0.5145

XXV.—WORLD'S PRODUCTION OF GOLD AND SILVER FOR CALENDAR YEARS 1900, 1901, AND 1902—Continued.

1900.

Country.	GOLD.			SILVER.			
	Kilograms (fine).	Ounces (fine).	Value.	Kilograms (fine).	Ounces (fine).	Coining value.	Commercial value.
North America:							
United States	119,126	3,829,897	$79,171,000	1,793,395	57,647,000	$74,533,500	$35,741,100
Mexico	13,542	435,375	[a]9,000,000	1,786,887	57,437,808	74,263,000	35,611,400
Canada	41,951	1,348,720	27,880,500	138,400	4,448,755	5,751,900	2,758,200
Africa	13,048	419,503	8,671,900	....	....	....	....
Australasia	110,591	3,555,506	73,498,900	415,014	13,340,263	17,248,000	8,271,000
Europe:							
Russia	30,312	974,537	20,145,500	4,458	143,299	185,300	88,800
Austria-Hungary	3,223	103,615	2,141,900	61,871	1,988,774	2,571,300	1,233,000
Germany	99	3,192	66,000	168,350	5,411,441	6,996,600	3,355,100
Norway	....	....	....	5,377	172,839	223,500	107,200
Sweden	88	2,845	58,800	1,928	61,983	80,100	38,400
Italy	53	1,704	35,200	23,374	751,335	971,400	465,800
Spain	13	418	8,600	99,095	3,185,316	4,118,400	1,974,900
Portugal	3	83	1,700	[c]119	3,790	4,900	2,300
Greece	....	....	....	31,472	1,011,656	1,308,000	627,200
Turkey	[c]21	675	14,000	[c]4,422	142,141	183,800	88,100
Finland	[b]3	84	1,700	244	7,843	10,100	4,900
France	....	....	....	14,067	452,151	584,600	280,300
Great Britain	415	13,360	276,200	6,896	221,673	286,600	137,400
South America:							
Argentina	66	2,112	43,700	1,178	37,898	49,000	23,500
Bolivia	180	5,786	119,600	341,295	10,970,610	14,184,200	6,801,800
Chile	2,449	78,735	1,627,600	[b]129,503	4,162,718	5,382,100	2,580,900
Colombia	1,798	57,804	1,194,900	57,994	1,864,165	2,410,200	1,155,800
Ecuador	162	5,208	107,700	240	7,734	[a]10,000	4,800
Brazil	4,176	134,260	2,775,400	....	....	....	....
Venezuela	483	15,538	321,200	....	....	....	....
Guiana (British)	3,063	98,487	2,035,900	....	....	....	....
Guiana (Dutch)	698	22,439	463,800	....	....	....	....
Guiana (French)	2,378	76,468	1,580,700	....	....	....	....
Peru	1,633	52,498	1,085,200	226,973	7,295,825	9,433,000	4,523,400
Uruguay	46	1,492	30,800	25	800	1,000	500
Central America	752	24,188	500,000	31,523	1,013,285	1,310,100	628,200
Asia:							
Japan	1,808	58,127	1,201,600	53,809	1,729,603	2,236,300	1,072,400
China	8,387	269,662	[b]5,574,400	....	....	....	....
Korea	6,771	217,687	4,500,000	....	....	....	....
India (British)	14,197	456,444	9,435,500	....	....	....	....
East Indies (British)	860	27,643	571,400	....	....	....	....
East Indies (Dutch)	654	21,043	435,000	2,509	80,659	104,300	50,000
Total	383,049	12,315,135	254,576,300	5,400,418	173,591,364	224,441,200	107,626,400

[a] Estimate Bureau of the Mint. [b] Figures for 1899 repeated. [c] Figures for 1898 repeated.

WORLD'S PRODUCTION OF GOLD AND SILVER FOR CALENDAR YEARS 1900, 1901, AND 1902—Continued.

Country.	1901.						
	Gold.			Silver.			
	Kilograms (fine).	Ounces (fine).	Value.	Kilograms (fine).	Ounces (fine).	Coining value.	Commercial value.
North America:							
United States	118,367	3,805,500	$78,666,700	1,717,705	55,214,000	$71,387,800	$33,128,400
Mexico	15,475	497,527	10,284,800	1,793,692	57,656,549	74,545,900	34,593,900
Canada	36,305	1,167,216	24,128,500	163,099	5,242,697	6,778,400	3,145,600
Africa	13,677	439,704	9,089,500	....	....	....	....
Australasia	115,679	3,719,080	76,880,200	318,256	10,230,046	13,226,700	6,138,000
Europe:							
Russia	34,383	1,105,412	22,850,900	4,884	156,993	203,000	94,200
Austria-Hungary	3,215	103,363	2,136,700	62,118	1,996,706	2,581,600	1,198,000
Germany	90	2,893	59,800	171,778	5,521,648	7,139,100	3,313,000
Norway	....	....	....	5,161	165,902	214,500	99,500
Sweden	63	2,017	41,700	1,680	53,986	69,800	32,400
Italy	8	257	5,300	30,000	964,333	1,246,800	578,600
Spain	[a] 13	418	8,600	99,095	3,185,316	4,118,400	1,911,200
Portugal	2	63	1,300	[a] 119	3,790	4,900	2,300
Greece	....	....	....	35,902	1,154,046	1,492,100	692,400
Turkey	37	1,185	24,500	13,352	429,180	554,900	257,500
Finland	2	63	1,300	[a] 244	7,843	10,100	4,700
France	....	....	....	11,954	384,263	496,800	230,600
Great Britain	175	5,626	116,300	5,392	173,297	224,100	104,000
South America:							
Argentina	45	1,451	30,000	1,405	45,166	58,400	27,100
Bolivia	180	5,786	119,600	404,201	12,992,695	16,798,600	7,795,600
Chile	1,606	51,626	1,067,200	287,926	9,255,130	11,966,200	5,553,100
Colombia	4,215	135,513	2,801,300	58,537	1,881,649	2,432,800	1,129,000
Ecuador	165	5,321	110,000	[a] 240	7,734	10,000	4,600
Brazil	4,176	134,260	2,775,400	....	....	....	....
Venezuela	483	15,538	321,200	....	....	....	....
Guiana (British)	2,666	85,701	1,771,600	....	....	....	....
Guiana (Dutch)	610	19,621	405,600	....	....	....	....
Guiana (French)	[b] 3,009	96,750	2,000,000	....	....	....	....
Peru	865	27,825	575,200	110,965	3,566,868	4,611,700	2,140,100
Uruguay	47	1,530	31,700	[a] 25	800	1,000	500
Central America	963	30,974	640,300	27,365	879,666	1,137,400	527,800
Asia:							
Japan	1,808	58,127	1,201,600	[a] 53,809	1,729,603	2,236,300	1,037,800
China	13,680	439,801	9,091,500	....	....	....	....
Korea	[a] 6,771	217,687	4,500,000	....	....	....	....
India (British)	14,138	454,527	9,395,900	....	....	....	....
East Indies (British)	1,296	41,685	861,700	....	....	....	....
East Indies (Dutch)	748	24,042	497,000	3,465	111,377	144,000	66,800
Total	394,962	12,698,089	262,492,900	5,382,369	173,011,283	223,691,300	103,806,700

[a] Figures for 1900 repeated.
[b] Estimate Bureau of the Mint.

World's Production of Gold and Silver for the Calendar Year 1902.

Country.	GOLD.			SILVER.			
	Kilograms (fine).	Ounces (fine).	Value.	Kilograms (fine).	Ounces (fine).	Coining value.	Commercial value.
North America:							
United States	120,373	3,870,000	$80,000,000	1,726,603	55,500,000	$71,757,600	$29,415,000
Mexico	15,279	491,156	10,153,100	1,872,091	60,176,604	77,804,100	31,893,600
Canada	31,209	1,003,355	20,741,200	133,891	4,303,774	5,564,500	2,281,000
Africa	58,716	1,887,773	39,023,700	....	....	....	....
Australasia	122,749	3,946,374	81,578,800	249,690	8,026,037	10,377,100	4,253,800
Europe:							
Russia	33,905	1,090,053	22,533,400	4,937	158,679	205,200	84,100
Austria-Hungary	3,267	105,037	2,171,300	58,523	1,881,132	2,432,200	997,000
Germany	94	3,023	62,500	178,032	5,722,641	7,399,000	3,033,000
Norway	3	97	2,000	6,422	206,413	266,900	109,400
Sweden	94	3,023	62,500	1,439	46,226	59,800	24,500
Italy	8	257	5,300	30,000	964,339	1,246,800	511,100
Spain	15	494	10,200	115,113	3,700,189	4,784,100	1,961,100
Portugal	2	63	1,300	118	3,773	4,900	2,000
Greece	....	....	....	33,915	1,090,188	1,409,500	577,800
Turkey	46	1,480	30,600	14,949	480,566	621,300	254,700
Finland	2	63	1,300	269	8,679	11,200	4,600
France	....	....	....	11,956	384,339	496,900	203,700
Great Britain	175	5,626	116,300	5,387	173,208	223,900	91,800
South America:							
Argentina	45	1,451	30,000	1,174	37,720	48,800	20,000
Bolivia	7	228	4,700	404,201	12,992,641	16,798,600	6,886,100
Chile	866	27,825	575,200	110,962	3,566,792	4,611,600	1,890,400
Colombia	3,796	122,031	2,522,600	55,269	1,776,604	2,297,000	941,600
Ecuador	301	9,675	200,000	240	7,736	10,000	4,100
Brazil	3,001	96,488	1,994,600	....	....	....	....
Venezuela	653	20,985	433,800	58	1,887	2,400	1,000
Guiana (British)	2,721	87,491	1,808,600	....	....	....	....
Guiana (Dutch)	484	15,577	322,000	....	....	....	....
Guiana (French)	3,642	117,077	2,420,200	....	....	....	....
Peru	3,500	112,525	2,326,100	132,668	4,264,528	5,513,700	2,260,200
Uruguay	87	2,796	57,800	24	755	1,000	400
Central America	3,012	96,842	2,001,900	30,217	971,320	1,255,800	514,800
Asia:							
Japan	1,936	62,259	1,287,000	12,151	390,567	505,000	207,000
China	13,138	422,401	8,731,800	....	....	....	....
Korea	5,266	169,313	3,500,000	....	....	....	....
British India	14,428	463,824	9,588,100	....	....	....	....
East Indies (British)	1,545	49,686	1,027,100	....	....	....	....
East Indies (Dutch)	850	27,312	564,600	3,679	118,302	152,900	62,700
Total	445,215	14,313,660	295,889,600	5,193,978	166,955,639	215,861,800	88,486,500

XXVI.—PRODUCTION OF GOLD AND SILVER IN

[From 1493 to 1885 is from a table of averages for certain periods, compiled by Dr. Adolph Soetbeer.

	Period.	GOLD.			
		Average annual for period.		Total for period.	
		Fine ounces.	Value.	Fine ounces.	Value.
1	1493–1520	186,470	$3,855,000	5,221,160	$107,931,000
2	1521–1544	230,194	4,759,000	5,524,656	114,205,000
3	1545–1560	273,596	5,656,000	4,377,544	90,492,000
4	1561–1580	219,906	4,546,000	4,398,120	90,917,000
5	1581–1600	237,267	4,905,000	4,745,340	98,095,000
6	1601–1620	273,918	5,662,000	5,478,360	113,248,000
7	1621–1640	266,845	5,516,000	5,336,900	110,324,000
8	1641–1660	281,955	5,828,000	5,639,110	116,571,000
9	1661–1680	297,709	6,154,000	5,954,180	123,084,000
10	1681–1700	346,095	7,154,000	6,921,895	143,088,000
11	1701–1720	412,163	8,520,000	8,243,260	170,403,000
12	1721–1740	613,422	12,681,000	12,268,440	253,611,000
13	1741–1760	791,211	16,356,000	15,824,230	327,116,000
14	1761–1780	665,666	13,761,000	13,313,315	275,211,000
15	1781–1800	571,948	11,823,000	11,438,970	236,464,000
16	1801–1810	571,563	11,815,000	5,715,627	118,152,000
17	1811–1820	367,957	7,606,000	3,679,568	76,063,000
18	1821–1830	457,044	9,448,000	4,570,444	94,479,000
19	1831–1840	652,291	13,484,000	6,522,913	134,841,000
20	1841–1850	1,760,502	36,393,000	17,605,018	363,928,000
21	1851–1855	6,410,324	132,513,000	32,051,621	662,566,000
22	1856–1860	6,486,262	134,083,000	32,431,312	670,415,000
23	1861–1865	5,949,582	122,989,000	29,747,913	614,944,000
24	1866–1870	6,270,086	129,614,000	31,350,430	648,071,000
25	1871–1875	5,591,014	115,577,000	27,955,068	577,883,000
26	1876–1880	5,543,110	114,586,000	27,715,550	572,931,000
27	1881–1885	4,794,755	99,116,000	23,973,773	495,582,000
28	1886–1890	5,461,282	112,895,000	27,306,411	564,474,000
29	1891–1895	7,882,565	162,947,000	39,412,823	814,736,000
30	1896	9,783,914	202,251,600	9,783,914	202,251,600
31	1897	11,420,068	236,073,700	11,420,068	236,073,700
32	1898	13,877,806	286,879,700	13,877,806	286,879,700
33	1899	14,837,775	306,724,100	14,837,775	306,724,100
34	1900	12,315,135	254,576,300	12,315,135	254,576,300
35	1901	12,698,089	262,492,900	12,698,089	262,492,900
36	1902	14,313,660	295,889,600	14,313,660	295,889,600
	Total			513,970,398	10,624,712,900

THE WORLD SINCE THE DISCOVERY OF AMERICA.

For the years 1886 to 1898 the production is the annual estimate of the Bureau of the Mint.]

SILVER.				PERCENTAGE OF PRODUCTION.				
Annual average for period.		Total for period.		By weight.		By value.		
Fine ounces.	Coining value.	Fine ounces.	Coining value.	Gold.	Silver.	Gold.	Silver.	
1,511,050	$1,954,000	42,309,400	$54,703,000	11	89	66.4	33.6	1
2,899,930	3,740,000	69,598,320	89,986,000	7.4	92.6	55.9	44.1	2
10,017,940	12,952,000	160,287,040	207,240,000	2.7	97.3	30.4	69.6	3
9,628,925	12,450,000	192,578,500	248,990,000	2.2	97.8	26.7	73.3	4
13,467,635	17,413,000	269,352,700	348,254,000	1.7	98.3	22	78	5
13,596,235	17,579,000	271,924,700	351,579,000	2	98	24.4	75.6	6
12,654,240	16,361,000	253,084,800	327,221,000	2.1	97.9	25.2	74.8	7
11,776,545	15,226,000	235,530,900	304,525,000	2.3	97.7	27.7	72.3	8
10,834,550	14,008,000	216,691,000	280,166,000	2.7	97.3	30.5	69.5	9
10,992,085	14,212,000	219,841,700	284,240,000	3.1	96.9	33.5	66.5	10
11,432,540	14,781,000	228,650,800	295,629,000	3.5	96.5	36.6	63.4	11
13,863,080	17,924,000	277,261,600	358,480,000	4.2	95.8	41.4	58.6	12
17,140,612	22,162,000	342,812,235	443,232,000	4.4	95.6	42.5	57.5	13
20,985,591	27,133,000	419,711,820	542,658,000	3.1	96.9	33.7	66.3	14
28,261,779	36,540,000	565,235,580	730,810,000	2	98	24.4	75.6	15
28,746,922	37,168,000	287,469,225	371,677,000	1.9	98.1	24.1	75.9	16
17,385,755	22,479,000	173,857,555	224,780,000	2.1	97.9	25.3	74.7	17
14,807,004	19,144,000	148,070,040	191,444,000	3	97	33	67	18
19,175,867	24,793,000	191,758,675	247,930,000	3.3	96.7	35.2	64.8	19
25,090,342	32,440,000	250,903,422	324,400,000	6.6	93.4	52.9	47.1	20
28,488,597	36,824,000	142,442,986	184,169,000	18.4	81.6	78.3	21.7	21
29,095,428	37,618,000	145,477,142	188,092,000	18.2	81.8	78.1	21.9	22
35,401,972	45,772,000	177,009,862	228,861,000	14.4	85.6	72.9	27.1	23
43,051,583	55,663,000	215,257,914	278,313,000	12.7	87.3	70	30	24
63,317,014	81,864,000	316,585,069	409,322,000	8.1	91.9	58.5	41.5	25
78,775,602	101,851,000	393,878,009	509,256,000	6.6	93.4	53	47	26
92,003,944	118,955,000	460,019,722	594,773,000	5	95	45.5	54.5	27
108,911,431	140,815,000	544,557,155	704,074,000	4.8	95.2	44.5	55.5	28
157,581,331	203,742,000	787,906,656	1,018,708,000	4.8	95.2	44.4	55.6	29
157,061,370	203,069,200	157,061,370	203,069,200	5.9	94.1	49.9	50.1	30
160,421,082	207,413,000	160,421,082	207,413,000	6.7	93.3	53.2	46.8	31
169,055,253	218,576,800	169,055,253	218,576,800	7.6	92.4	56.8	43.2	32
168,337,453	217,648,200	168,337,453	217,648,200	8.1	91.9	58.5	41.5	33
173,011,364	224,441,200	173,591,364	224,441,200	6.6	93.4	53.2	46.8	34
173,011,283	223,691,300	173,011,283	223,691,300	6.8	93.2	54	46	35
166,955,639	215,861,800	166,955,639	215,861,800	7.9	92.1	57.8	42.2	36
....	....	9,168,497,971	11,854,213,500	5.3	94.7	47.3	52.7	

XXVII.—Coinage of the Mints of the United States, from their Organization, 1792, to December, 31, 1902.

Denominations.	Pieces.	Value.
GOLD.		
Double eagles	82,095,258	$1,641,905,160.00
Eagles	37,061,794	370,617,940.00
Half eagles	57,875,573	289,377,865.00
Three-dollar pieces (coinage discontinued, act of Sept. 26, 1890)	539,792	1,619,376.00
Quarter eagles	11,871,403	29,678,507.50
Dollars (coinage discontinued, act of Sept. 26, 1890)	19,499,337	19,499,337.00
Dollars, Louisiana Purchase Exposition (act of June 28, 1902)	75,080	75,080.00
Total gold	209,018,237	2,352,773,265.50
SILVER.		
Dollars (coinage discontinued, act of Feb. 12, 1873; resumed, act of Feb. 28, 1878)	559,147,443	559,147,443.00
Trade dollars (authorized Feb. 12, 1873; discontinued, act of Feb. 19, 1887)	35,965,924	35,965,924.00
Lafayette souvenir dollars (act of Mar. 3, 1899)	50,000	50,000.00
Half dollars	311,642,722	155,821,361.00
Half dollars, Columbian souvenir (act of Aug. 5, 1892)	5,002,105	2,501,052.50
Quarter dollars	291,664,319	72,916,079.75
Quarter dollars, Columbian souvenir (act of Mar. 3, 1893)	40,023	10,005.75
Twenty-cent pieces (authorized Mar. 3, 1875; discontinued, act of May 2, 1878)	1,355,000	271,000.00
Dimes	406,471,559	42,647,155.90
Half dimes (discontinued, act of Feb. 12, 1873)	97,604,388	4,880,219.40
Three-cent pieces (discontinued, act of Feb. 12, 1873)	42,736,240	1,282,087.20
Total silver	1,751,679,723	875,492,328.50
MINOR.		
Five-cent pieces, nickel (authorized, act of May 16, 1866)	434,104,054	21,705,202.70
Three-cent pieces, nickel (discontinued, act of Sept. 26, 1890)	31,378,316	941,349.48
Two-cent pieces, bronze (discontinued, act of Sept. 26, 1890)	45,601,000	912,020.00
One-cent pieces, copper (discontinued, act of Feb. 21, 1857)	156,288,744	1,562,887.44
One-cent pieces, nickel (discontinued, act of Apr. 22, 1864)	200,772,000	2,007,720.00
One-cent pieces, bronze (authorized, act of Apr. 22, 1864)	1,211,501,824	12,115,018.24
Half-cent pieces, copper (discontinued, act of Feb. 21, 1857)	7,985,222	39,926.11
Total minor	2,087,631,160	39,284,123.97
Total coinage	4,048,329,120	3,267,549,717.97

Silver-dollar coinage under act of Apr. 2, 1792			$8,031,238
Silver-dollar coinage under Bland-Allison Act, Feb. 28, 1878		$378,166,793	
Silver-dollar coinage under Sherman Act, July 14, 1890, to Oct. 31, 1893	$36,087,285		
Coinage from repeal of purchasing clause (Nov. 1, 1893) of Sherman Act of June 12, 1898	42,139,872		
Coined under war-revenue bill approved June 13, 1898, to Dec. 31, 1902	89,643,783		
		167,870,940	
Act of Mar. 3, 1891, recoinage of trade dollars		5,078,472	
			551,116,205
Total			559,147,443

XXVIII.—COINAGE OF SILVER DOLLARS, FRACTIONAL AND SUBSIDIARY SILVER, BY ACTS AND DENOMINATIONS, FROM 1792 TO 1902.

Denomination.	1792 to 1853.	1853 to Feb. 12, 1873.	Feb. 12, 1873, to Dec. 31, 1902.	Total silver.
Dollars	$2, 506, 890. 00	$5, 524, 348. 00	$551, 116, 205. 00	$559, 147, 443. 00
Trade dollars			35, 965, 924. 00	35, 965, 924. 00
Lafayette souvenir dollars			50, 000. 00	50, 000. 00
Total dollars	2, 506, 890. 00	5, 524, 348. 00	587, 132, 129. 00	595, 163, 367. 00
Half dollars	66, 280, 640. 50	32, 666, 832. 50	56, 873, 888. 00	155, 821, 361. 00
Half dollars, Columbian			2, 501, 052. 50	2, 501, 052. 50
Quarter dollars	3, 994, 040. 50	17, 879, 790. 50	51, 042, 248. 75	72, 916, 079. 75
Quarter dollars, Columbian			10, 005. 75	10, 005. 75
Twenty-cent pieces			271, 000. 00	271, 000. 00
Dimes	3, 890, 230. 10	4, 908, 520. 00	33, 848, 405. 80	42, 647, 155. 90
Half dimes	1, 825, 126. 40	3, 055, 093. 00		4, 880, 219. 40
Three-cent pieces	744, 927. 00	537, 160. 20		1, 282, 087. 20
Total subsidiary	76, 734, 964. 50	59, 047, 396. 20	144, 546, 600. 80	280, 328, 961. 50
Total silver	79, 241, 851. 50	64, 571, 744. 20	731, 678, 729. 80	875, 492, 328. 50

Fractional silver coinage 1792 to 1853	$76, 734, 964. 50
Subsidiary silver coinage 1853 to Feb. 12, 1873	59, 047, 396. 20
Subsidiary silver coinage Feb. 12, 1873, to Dec. 31, 1902	144, 546, 600. 80
Total	280, 328, 961. 50

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

[Coinage of the mint at Philadelphia from

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles	Dollars.
1793 to 1795		$27,950	$43,535			
1796		60,800	16,995		$165.00	
1797		91,770	32,030		4,390.00	
1798		79,740	124,335		1,535.00	
1799		174,830	37,255		1,200.00	
1800		259,650	58,110			
1801		292,540	130,030			
1802		150,900	265,880		6,530.00	
1803		89,790	167,530		1,057.50	
1804		97,950	152,375		8,317.50	
1805			165,915		4,452.50	
1806			320,465		4,040.00	
1807			420,465		17,030.00	
1808			277,890		6,775.00	
1809			169,375			
1810			501,435			
1811			497,905			
1812			290,435			
1813			477,140			
1814			77,270			
1815			3,175			
1816						
1817						
1818			242,940			
1819			258,615			
1820			1,319,030			
1821			173,205		16,120.00	
1822			88,980			
1823			72,425			
1824			86,700		6,500.00	
1825			145,300		11,085.00	
1826			90,345		1,900.00	
1827			124,565		7,000.00	
1828			140,145			
1829			287,210		8,507.50	
1830			631,755		11,350.00	
1831			702,970		11,300.00	
1832			787,435		11,000.00	
1833			968,150		10,400.00	
1834			3,660,845		293,425.00	
1835			1,857,670		328,505.00	
1836			2,765,735		1,369,965.00	
1837			1,035,605		112,700.00	
1838		72,000	1,432,940		117,575.00	
1839		382,480	590,715		67,552.50	
1840		473,380	686,910		47,147.50	
1841		631,310	79,165			
1842		815,070	137,890		7,057.50	
1843		754,620	3,056,025		251,365.00	
1844		63,610	1,701,650		16,960.00	
1845		261,530	2,085,495		227,627.50	
1846		200,950	1,979,710		53,995.00	
1847		8,622,580	4,579,905		74,535.00	
1848		1,454,840	1,303,875		22,215.00	
1849		6,536,180	665,350		58,235.00	$688,567
1850	$23,405,220	2,914,510	322,455		632,307.50	481,953
1851	41,743,100	1,763,280	1,887,525		3,431,870.00	3,317,671
1852	41,060,520	2,631,060	2,869,505		2,899,202.50	2,045,351
1853	25,226,520	2,012,530	1,528,850		3,511,670.00	4,076,051
1854	15,157,980	542,500	803,375	$415,854	1,490,645.00	1,639,445
1855	7,293,320	1,217,010	585,490	151,665	588,700.00	758,269
1856	6,597,560	604,900	989,950	78,030	960,600.00	1,762,936
1857	8,787,500	166,060	490,940	62,673	535,325.00	774,789
1858	4,234,280	25,210	75.680	6,399	118,442.50	117,995
1859	871,940	160,930	84,070	46,914	98,610.00	168,244
1860	11,553,400	117,830	99.125	21,465	56,687.50	36,668
1861	59,529,060	1,132,330	3,199,750	18,216	3,181,295.00	527,499
1862	1,842,660	109,950	22,325	17,355	280,882.50	1,326,865
1863	2,855,800	12,480	12,360	15,117	75.00	6,250
1864	4,085,700	35,800	21,100	8,040	7,185.00	5,950
1865	7,024,000	40,050	6,475	3,495	3,862.50	3,725
Carried forward	261,268,560	35,080,900	50,967,775	845,223	20,996,875.00	17,738,228

NOTE.—Not susceptible of exact statement by years of actual date of coin, the registry of annual coinage being of coin delivered by coiners of mints within the given year, and these deliveries not having been invariably completed within the year of the date of the coin, as now required.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS.

its organization, 1793, to December 31, 1902.]

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
....	$204,791	$161,572.00	....	....	....	$4,320.80	....
....	72,920	....	$1,473.50	....	$2,213.50	511.50	....
....	7,776	1,959.00	63.00	....	2,526.10	2,226.35	....
....	327,536	....	....	....	2,755.00	....	....
....	423,515	....	....	....	....	....	....
....	220,920	....	....	....	2,176.00	1,200.00	....
....	54,454	15,144.50	....	....	3,464.00	1,695.50	....
....	41,650	14,945.00	....	....	1,097.50	650.50	....
....	66,064	15,857.50	....	....	3,304.00	1,892.50	....
....	19,570	78,259.50	1,684.50	....	826.50	....	....
....	321	105,861.00	30,348.50	....	12,078.00	780.00	....
....	....	419,788.00	51,531.00	....	....	....	....
....	....	525,788.00	55,160.75	....	16,500.00	....	....
....	....	684,300.00	....	....	....	....	....
....	....	702,905.00	....	....	4,471.00	....	....
....	....	638,138.00	....	....	635.50	....	....
....	....	601,822.00	....	....	6,518.00	....	....
....	....	814,029.50	....	....	....	....	....
....	....	620,951.50	....	....	....	....	....
....	....	519,537.50	....	....	42,150.00	....	....
....	....	....	17,308.00	....	....	....	....
....	....	23,575.00	5,000.75	....	....	....	....
....	....	607,783.50	....	....	....	....	....
....	....	980,161.00	90,293.50	....	....	....	....
....	....	1,104,000.00	36,000.00	....	....	....	....
....	....	375,561.00	31,861.00	....	94,258.70	....	....
....	....	652,898.50	54,212.75	....	118,651.20	....	....
....	....	779,786.50	16,020.00	....	10,000.00	....	....
....	....	847,100.00	4,450.00	....	44,000.00	....	....
....	....	1,752,477.00	....	....	....	....	....
....	....	1,471,583.00	42,000.00	....	51,000.00	....	....
....	....	2,002,090.00	....	....	....	....	....
....	....	2,746,700.00	1,000.00	....	121,500.00	....	....
....	....	1,537,600.00	25,500.00	....	12,500.00	....	....
....	....	1,856,078.00	....	....	77,000.00	61,500.00	....
....	....	2,382,400.00	....	....	51,000.00	62,000.00	....
....	....	2,936,830.00	99,500.00	....	77,135.00	62,135.00	....
....	....	2,398,500.00	80,000.00	....	52,250.00	48,250.00	....
....	....	2,603,000.00	39,000.00	....	48,500.00	68,500.00	....
....	....	3,206,002.00	71,500.00	....	63,500.00	74,000.00	....
....	....	2,676,003.00	488,000.00	....	141,000.00	138,000.00	....
....	1,000	3,273,100.00	118,000.00	....	119,000.00	95,000.00	....
....	....	1,814,910.00	63,100.00	....	104,200.00	113,800.00	....
....	....	1,773,000.00	208,000.00	....	199,250.00	112,750.00	....
....	300	1,667,280.00	122,786.50	....	105,311.50	53,457.50	....
....	61,005	717,504.00	47,031.75	....	135,858.00	67,204.25	....
....	173,000	155,000.00	30,000.00	....	162,250.00	57,500.00	....
....	184,618	1,006,382.00	22,000.00	....	188,750.00	40,750.00	....
....	165,100	1,922,000.00	161,400.00	....	137,000.00	58,250.00	....
....	20,000	883,000.00	105,300.00	....	7,250.00	21,500.00	....
....	24,500	294,500.00	230,500.00	....	175,500.00	78,200.00	....
....	110,600	1,105,000.00	127,500.00	....	3,130.00	1,350.00	....
....	140,750	578,000.00	183,500.00	....	24,500.00	63,700.00	....
....	15,000	290,000.00	36,500.00	....	45,150.00	33,400.00	....
....	62,600	626,000.00	85,000.00	....	83,900.00	65,450.00	....
....	7,500	113,500.00	47,700.00	....	193,150.00	47,750.00	....
....	1,300	100,375.00	40,000.00	....	102,650.00	39,050.00	$163,422.00
....	1,100	38,565.00	44,265.00	....	153,550.00	50,025.00	559,905.00
....	46,110	1,766,354.00	3,813,555.00	....	1,217,301.00	667,251.00	342,000.00
....	33,140	1,491,000.00	3,095,000.00	....	447,000.00	287,000.00	20,130.00
....	26,000	379,750.00	714,250.00	....	207,500.00	87,500.00	4,170.00
....	63,500	469,000.00	1,816,000.00	....	578,000.00	244,000.00	43,740.00
....	94,000	994,000.00	2,411,000.00	....	558,000.00	364,000.00	31,260.00
....	....	2,113,000.00	1,842,000.00	....	154,000.00	175,000.00	48,120.00
....	256,500	374,000.00	336,000.00	....	43,000.00	17,000.00	10,950.00
....	218,930	151,850.00	201,350.00	....	60,700.00	39,950.00	8,610.00
....	78,500	1,444,200.00	1,213,650.00	....	192,400.00	164,050.00	14,940.00
....	12,090	126,175.00	233,137.50	....	84,755.00	74,627.50	10,906.50
....	27,660	251,830.00	48,015.00	....	1,446.00	923.00	643.80
....	31,170	189,785.00	23,517.50	....	3,907.00	23.50	14.10
....	47,000	255,950.00	14,825.00	....	1,050.00	675.00	255.00
....	3,342,490	65,225,996.50	18,676,790.50	....	6,552,468.50	3,648,798.90	1,259,066.40

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

[Coinage of the mint at Philadelphia from

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.
Brought forward	$261,268,560	$35,080,900	$50,967,775	$845,223	$20,996,875.00	$17,738,228
1866	13,975,500	37,800	33,600	12,090	7,775.00	7,180
1867	5,021,300	31,400	34,600	7,950	8,125.00	5,250
1868	1,972,000	106,550	28,625	14,625	9,062.50	10,525
1869	3,503,100	18,550	8,925	7,575	10,862.50	5,925
1870	3,103,700	25,350	20,175	10,605	11,387.50	6,335
1871	1,603,000	17,800	16,150	3,990	13,375.00	3,930
1872	5,037,600	16,500	8,450	6,090	7,575.00	3,530
1873	34,196,500	8,250	562,525	75	445,062.50	125,125
1874	7,336,000	531,600	17,540	125,460	9,850.00	198,820
1875	5,914,800	1,200	1,100	60	1,050.00	420
1876	11,678,100	7,320	7,385	135	10,552.50	3,245
1877	7,953,400	8,170	5,760	4,464	4,130.00	3,920
1878	10,872,900	738,000	658,700	246,972	715,650.00	3,020
1879	4,152,600	3,847,700	1,509,750	9,090	222,475.00	3,030
1880	1,029,120	16,448,760	15,832,180	3,108	7,490.00	1,636
1881	45,200	38,772,600	28,544,000	1,650	1,700.00	7,660
1882	12,600	23,244,800	12,572,800	4,620	10,100.00	5,040
1883	800	2,087,400	1,167,200	2,820	4,900.00	10,840
1884	1,420	769,050	955,240	3,318	4,982.50	6,206
1885	16,560	2,535,270	3,007,530	2,730	2,217.50	12,205
1886	22,120	2,361,600	1,942,160	3,426	10,220.00	6,016
1887	2,420	536,800	435	18,480	15,705.00	8,543
1888	4,525,320	1,329,960	91,480	15,873	40,245.00	16,080
1889	882,220	44,850	37,825	7,287	44,120.00	30,729
1890	1,519,900	580,430	21,640	....	22,032.50	....
1891	28,840	918,680	307,065	....	27,600.00	....
1892	90,460	7,975,520	3,767,860	....	6,362.50	....
1893	6,886,780	18,408,950	7,640,985	....	75,265.00	....
1894	27,379,800	24,707,780	4,789,775	....	10,305.00	....
1895	22,293,120	5,678,260	6,729,680	....	15,297.50	....
1896	15,853,260	763,480	295,315	....	48,005.00	....
1897	27,665,220	10,001,590	4,339,415	....	74,760.00	....
1898	3,409,400	8,121,970	3,167,475	....	60,412.50	....
1899	33,387,680	12,623,050	8,553,645	....	68,375.00	....
1900	37,491,680	2,939,600	7,028,650	....	168,012.50	....
1901	2,230,520	17,188,250	3,080,200	....	228,307.50	....
1902	625,080	825,130	862,810	....	334,332.50	[e]75,080
Total	562,988,580	239,340,870	168,616,425	1,357,716	23,754,555.00	18,298,518

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its organization, 1793, to December 31, 1902.]

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
....	$3,342,490	$65,225,996.50	$18,676,790.50	....	$6,552,468.50	$3,648,798.90	$1,259,066.40
....	49,625	372,812.50	4,381.25	....	872.50	536.25	681.75
....	60,325	212,162.50	5,156.25	....	662.50	431.25	138.75
....	182,700	189,100.00	7,500.00	....	46,625.00	4,295.00	123.00
....	424,300	397,950.00	4,150.00	....	25,660.00	10,430.00	153.00
....	433,000	300,450.00	21,850.00	....	47,150.00	26,830.00	120.00
....	1,115,760	582,680.00	42,808.00	....	75,361.00	74,443.00	127.80
....	1,106,450	440,775.00	45,737.50	....	239,645.00	147,397.50	58.50
$397,500	293,600	1,308,750.00	371,075.00	....	394,710.00	35,630.00	18.00
987,800	....	1,180,150.00	117,975.00	....	294,070.00	....	....
218,900	....	3,013,750.00	1,073,375.00	$7,940	1,035,070.00	....	....
456,150	....	4,209,575.00	4,454,287.50	3,180	1,146,115.00	....	....
3,039,710	....	4,152,255.00	2,727,927.50	102	731,051.00	....	....
900	10,509,550	689,200.00	565,200.00	120	167,880.00	....	....
1,541	14,807,100	2,950.00	3,675.00	....	1,510.00	....	....
1,987	12,601,355	4,877.50	3,738.75	....	3,735.50	....	....
960	9,163,975	5,487.50	3,243.75	....	2,497.50	....	....
1,097	11,101,100	2,750.00	4,075.00	....	391,110.00	....	....
979	12,291,039	4,519.50	3,859.75	....	767,571.20	....	....
....	14,070,875	2,637.50	2,218.75	....	336,638.00	....	....
....	17,787,767	3,065.00	3,632.50	....	253,342.70	....	....
....	19,963,886	2,943.00	1,471.50	....	637,757.00	....	....
....	20,290,710	2,855.00	2,677.50	....	1,128,393.90	....	....
....	19,183,833	6,416.50	2,708.25	....	549,648.70	....	....
....	21,726,811	6,355.50	3,177.75	....	738,071.10	....	....
....	16,802,590	6,295.00	20,147.50	....	991,154.10	....	....
....	8,694,206	100,300.00	980,150.00	....	1,531,060.00	....	....
....	1,037,245	[a] 942,622.50	2,059,311.25	....	1,212,124.50	....	....
....	378,792	[b] 2,939,448.50	[c] 1,371,203.75	....	334,079.20	....	....
....	110,972	574,486.00	858,243.00	....	133,097.20	....	....
....	12,880	917,609.00	1,110,220.00	....	69,088.00	....	....
....	9,976,762	475,381.00	968,690.50	....	200,076.20	....	....
....	2,822,731	1,240,365.50	2,035,182.75	....	1,086,926.40	....	....
....	5,884,735	1,478,367.50	2,775,183.75	....	1,632,073.50	....	....
....	330,846	2,769,423.00	3,156,211.50	....	1,958,084.60	....	....
....	[d] 8,880,912	2,381,456.00	2,504,228.00	....	1,760,091.20	....	....
....	6,962,813	2,134,406.50	2,223,203.25	....	1,886,047.80	....	....
....	7,994,777	2,461,388.50	3,049,436.00	....	2,138,077.70	....	....
5,107,524	260,396,512	100,742,012.50	51,264,103.25	11,342	30,499,596.50	3,948,791.90	1,260,487.20

[a] Includes Columbian souvenir half dollars, 1892, $475,000.
[b] Includes Columbian souvenir half dollars, 1893, $2,026,052.50.
[c] Includes Columbian souvenir quarter dollars, 1893, $10,005.75.
[d] Includes 50,000 Lafayette souvenir dollars.
[e] Louisiana Purchase Exposition.

XXIX.—Coinage of the Mints of the United States

[Coinage of the mint at Philadelphia from

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
1793–1795			
1796			
1797			
1798			
1799			
1800			
1801			
1802			
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1862			
1863			
1864			$396,950.00
1865		$341,460.00	272,800.00
1866	$737,125.00	144,030.00	63,540.00
1867	1,545,475.00	117,450.00	58,775.00
1868	1,440,850.00	97,560.00	56,075.00
1869	819,750.00	48,120.00	30,930.00
Carried forward	4,543,200.00	748,620.00	879,070.00

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its organization, 1793, to December 31, 1902.]

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$10,660.33	$712.67	$71,485.00	$370,683.80	$11,373.00	$453,541.80
9,747.00	577.40	77,960.00	77,118.50	10,324.40	165,402.90
8,975.10	535.24	128,190.00	14,550.45	9,510.34	152,250.79
9,797.00	....	205,610.00	330,291.00	9,797.00	545,698.00
9,045.85	60.83	213,285.00	423,515.00	9,106.68	645,906.68
28,221.75	1,057.65	317,760.00	224,296.00	29,279.40	571,335.40
13,628.37	....	422,570.00	74,758.00	13,628.37	510,956.37
34,351.00	71.83	423,310.00	58,343.00	34,422.83	516,075.83
24,713.53	489.50	258,377.50	87,118.00	25,203.03	370,698.53
7,568.38	5,276.56	258,642.50	100,340.50	12,844.94	371,827.94
9,411.16	4,072.32	170,367.50	149,388.50	13,483.48	333,239.48
3,480.00	1,780.00	324,505.00	471,319.00	5,260.00	801,084.00
7,272.21	2,380.00	437,495.00	597,448.75	9,652.21	1,044,595.96
11,090.00	2,000.00	284,665.00	684,300.00	13,090.00	982,055.00
2,228.67	5,772.86	169,375.00	707,376.00	8,001.53	884,752.53
14,585.00	1,075.00	501,435.00	638,773.50	15,660.00	1,155,868.50
2,180.25	315.70	497,905.00	608,340.00	2,495.95	1,108,740.95
10,755.00	....	290,435.00	814,029.50	10,755.00	1,115,219.50
4,180.00	....	477,140.00	620,951.50	4,180.00	1,102,271.50
3,578.30	....	77,270.00	561,687.50	3,578.30	642,535.80
....	....	3,175.00	17,308.00	....	20,483.00
28,209.82	....	....	28,575.75	28,209.82	56,785.57
39,484.00	....	....	607,783.50	39,484.00	647,267.50
31,670.00	....	242,940.00	1,070,454.50	31,670.00	1,345,064.50
26,710.00	....	258,615.00	1,140,000.00	26,710.00	1,425,325.00
44,075.50	....	1,319,030.00	501,680.70	44,075.50	1,864,786.20
3,890.00	....	189,325.00	825,762.45	3,890.00	1,018,977.45
20,723.39	....	88,980.00	805,806.50	20,723.39	915,509.89
....	....	72,425.00	895,550.00	....	967,975.00
12,620.00	....	93,200.00	1,752,477.00	12,620.00	1,858,297.00
14,611.00	315.00	156,385.00	1,564,583.00	14,926.00	1,735,894.00
15,174.25	1,170.00	92,245.00	2,002,090.00	16,344.25	2,110,679.25
23,577.32	....	131,565.00	2,869,200.00	23,577.32	3,024,342.32
22,606.24	3,030.00	140,145.00	1,575,600.00	25,636.24	1,741,381.24
14,145.00	2,435.00	295,717.50	1,994,578.00	16,580.00	2,306,875.50
17,115.00	....	643,105.00	2,495,400.00	17,115.00	3,155,620.00
33,592.60	11.00	714,270.00	3,175,600.00	33,603.60	3,923,473.60
23,620.00	....	798,435.00	2,579,000.00	23,620.00	3,401,055.00
27,390.00	770.00	978,550.00	2,759,000.00	28,160.00	3,765,710.00
18,551.00	600.00	3,954,270.00	3,415,002.00	19,151.00	7,388,423.00
38,784.00	705.00	2,186,175.00	3,443,003.00	39,489.00	5,668,667.00
21,110.00	1,990.00	4,135,700.00	3,606,100.00	23,100.00	7,764,900.00
55,583.00	....	1,148,305.00	2,096,010.00	55,583.00	3,299,898.00
63,702.00	....	1,622,515.00	2,293,000.00	63,702.00	3,979,217.00
31,286.61	....	1,040,747.50	1,949,135.50	31,286.61	3,021,169.61
24,627.00	....	1,207,437.50	1,028,603.00	24,627.00	2,260,667.50
15,973.67	....	710,475.00	577,750.00	15,973.67	1,304,198.67
23,833.90	....	960,017.50	1,442,500.00	23,833.90	2,426,351.40
24,283.20	....	4,062,010.00	2,443,750.00	24,283.20	6,530,043.20
23,987.52	....	1,782,220.00	1,037,050.00	23,987.52	2,843,257.52
38,948.04	....	2,574,652.50	803,200.00	38,948.04	3,416,800.54
41,208.00	....	2,234,655.00	1,347,580.00	41,208.00	3,623,443.00
61,836.69	....	13,277,020.00	990,450.00	61,836.69	14,329,306.69
64,157.99	....	2,780,930.00	420,050.00	64,157.99	3,265,137.99
41,785.00	199.32	7,948,332.00	922,950.00	41,984.32	8,913,266.32
44,268.44	199.06	27,756,445.50	409,600.00	44,467.50	28,210,513.00
98,897.07	738.36	52,143,446.00	446,797.00	99,635.43	52,689,878.43
50,630.94	....	51,505,638.50	847,410.00	50,630.94	52,403,679.44
66,411.31	648.47	36,355,621.00	7,852,571.00	67,059.78	44,275,251.78
42,361.56	276.79	20,049,799.00	5,373,270.00	42,638.35	25,465,707.35
15,748.29	282.50	10,594,454.00	1,419,170.00	16,030.79	12,029,654.79
26,904.63	202.15	10,993,976.00	3,214,240.00	27,106.78	14,235,322.78
177,834.56	175.90	10,817,287.00	4,452,260.00	178,010.46	15,447,557.46
246,000.00	....	4,578,006.50	4,332,120.00	246,000.00	9,156,126.50
364,000.00	....	1,430,708.00	1,037,450.00	364,000.00	2,832,158.00
205,660.00	....	11,885,175.50	681,390.00	205,660.00	12,772,225.50
101,000.00	....	67,588,150.00	3,107,740.00	101,000.00	70,796,890.00
280,750.00	....	3,600,037.50	541,691.50	280,750.00	4,422,479.00
498,400.00	....	2,902,082.00	330,517.80	498,400.00	3,730,999.80
529,737.14	....	4,163,775.00	248,417.10	926,687.14	5,338,879.24
354,292.86	....	7,081,607.50	319,755.00	968,552.86	8,369,915.36
98,265.00	....	14,073,945.00	428,909.25	1,042,960.00	15,545,814.25
98,210.00	....	5,108,625.00	278,876.25	1,819,910.00	7,207,411.25
102,665.00	....	2,141,387.50	430,343.00	1,697,150.00	4,268,880.50
64,200.00	....	3,554,937.50	862,643.00	963,000.00	5,380,580.50
4,680,577.44	39,926.11	411,776,456.00	100,706,382.30	10,891,393.55	523,374,231.85

XXIX.—Coinage of the Mints of the United States

[Coinage of the mint at Philadelphia from

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
Brought forward	$4,543,200.00	$748,620.00	$879,070.00
1870	240,300.00	40,050.00	17,225.00
1871	28,050.00	18,120.00	14,425.00
1872	301,800.00	25,860.00	1,300.00
1873	227,500.00	35,190.00	
1874	176,900.00	23,700.00	
1875	104,850.00	6,840.00	
1876	126,500.00	4,860.00	
1877			
1878	117.50	70.50	
1879	1,455.00	1,236.00	
1880	997.75	748.65	
1881	3,618.75	32,417.25	
1882	573,830.00	759.00	
1883	1,148,471.05	318.27	
1884	563,697.10	169.26	
1885	73,824.50	143.70	
1886	166,514.50	128.70	
1887	763,182.60	238.83	
1888	536,024.15	1,232.49	
1889	794,068.05	646.83	
1890	812,963.60		
1891	841,717.50		
1892	584,982.10		
1893	668,509.75		
1894	270,656.60		
1895	498,994.20		
1896	442,146.00		
1897	1,021,436.75		
1898	626,604.35		
1899	1,301,451.55		
1900	1,362,799.75		
1901	1,324,010.65		
1902	1,574,028.95		
Total	21,705,202.70	941,349.48	912,020.00

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its organization, 1793, to December 31, 1902.]

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$4, 680, 577. 44	$39, 926. 11	$411, 776, 456. 00	$100, 706, 382. 30	$10, 891, 393. 55	$523, 374, 231. 85
52, 750. 00	....	3, 177, 552. 50	829, 400. 00	350, 325. 00	4, 357, 277. 50
39, 295. 00	....	1, 658, 245. 00	1, 891, 179. 80	99, 890. 00	3, 649, 314. 80
40, 420. 00	....	5, 079, 745. 00	1, 980, 063. 50	369, 380. 00	7, 429, 188. 50
116, 765. 00	....	35, 337, 537. 50	2, 801, 283. 00	379, 455. 00	38, 518, 275. 50
141, 875. 00	....	8, 219, 270. 00	2, 579, 995. 00	342, 475. 00	11, 141, 740. 00
135, 280. 00	....	5, 918, 630. 00	5, 349, 035. 00	246, 970. 00	11, 514, 635. 00
79, 440. 00	....	11, 706, 737. 50	10, 269, 307. 50	210, 800. 00	22, 186, 845. 00
8, 525. 00	....	7, 979, 844. 00	10, 651, 045. 50	8, 525. 00	18, 639, 414. 50
57, 998. 50	....	13, 235, 242. 00	11, 932, 850. 00	58, 186. 50	25, 226, 278. 50
162, 312. 00	....	9, 744, 645. 00	14, 816, 776. 00	165, 003. 00	24, 726, 424. 00
389, 649. 55	....	33, 322, 294. 00	12, 615, 693. 75	391, 395. 95	46, 329, 383. 70
392, 115. 75	....	67, 372, 810. 00	9, 176, 163. 75	428, 151. 75	76, 977, 125. 50
385, 811. 00	....	35, 849, 960. 00	11, 500, 132. 00	960, 400. 00	48, 310, 492. 00
455, 981. 09	....	3, 273, 960. 00	13, 067, 968. 45	1, 604, 770. 41	17, 946, 698. 86
232, 617. 42	....	1, 740, 216. 50	14, 412, 369. 25	796, 483. 78	16, 949, 069. 53
117, 653. 84	....	5, 576, 512. 50	18, 047, 807. 20	191, 622. 04	23, 815, 941. 74
176, 542. 90	....	4, 345, 542. 00	20, 606, 057. 50	343, 186. 10	25, 294, 785. 60
452, 264. 83	....	582, 383. 00	21, 424, 636. 40	1, 215, 686. 26	23, 222, 705. 66
374, 944. 14	....	6, 018, 958. 00	19, 742, 606. 45	912, 200. 78	26, 673, 765. 23
488, 693. 61	....	1, 047, 031. 00	22, 474, 415. 35	1, 283, 408. 49	24, 804, 854. 84
571, 828. 54	....	2, 144, 002. 50	17, 820, 186. 60	1, 384, 792. 14	21, 348, 981. 24
470, 723. 50	....	1, 282, 185. 00	11, 305, 716. 00	1, 312, 441. 00	13, 900, 342. 00
376, 498. 32	....	11, 840, 202. 50	5, 251, 303. 25	961, 480. 42	18, 052, 986. 17
466, 421. 95	....	33, 011, 980. 00	5, 023, 523. 45	1, 134, 931. 70	39, 170, 435. 15
167, 521. 32	....	56, 887, 660. 00	1, 676, 798. 20	438, 177. 92	59, 002, 636. 12
383, 436. 36	....	34, 716, 357. 50	2, 109, 797. 00	882, 430. 56	37, 708, 585. 06
390, 572. 93	....	16, 960, 060. 00	11, 620, 909. 70	832, 718. 93	29, 413, 688. 63
504, 663. 30	....	42, 080, 985. 00	7, 185, 205. 65	1, 526, 100. 05	50, 792, 290. 70
498, 230. 79	....	14, 759, 257. 50	11, 770, 359. 75	1, 124, 835. 14	27, 654, 452. 39
536, 000. 31	....	54, 632, 750. 00	8, 214, 565. 10	1, 837, 451. 86	64, 684, 766. 96
668, 337. 64	....	47, 627, 942. 50	15, 526, 687. 20	2, 031, 137. 39	65, 185, 767. 09
796, 111. 43	....	22, 727, 277. 50	13, 206, 470. 55	2, 120, 122. 08	38, 053, 870. 13
873, 767. 22	....	2, 722, 432. 50	15, 643, 679. 20	2, 447, 796. 17	20, 813, 907. 87
15, 685, 625. 68	39, 926. 11	1, 014, 356, 664. 00	453, 230, 369. 35	39, 284, 123. 97	1, 506, 871, 157. 32

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

[Coinage of the mint at San Francisco

Calendar years.	GOLD.						SILVER.	
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.	Dollars.	Trade dollars.
1854	$2, 829, 360	$1, 238, 260	$1, 340	....	$615	$14, 632	....	....
1855	17, 593, 500	90, 000	305, 000	$19, 800	....	....	....	....
1856	23, 795, 000	680, 000	525, 500	103, 500	177, 800	24, 600	....	....
1857	19, 410, 000	260, 000	435, 000	42, 000	170, 000	10, 000	....	....
1858	16, 934, 200	118, 000	93, 000	....	3, 000	10, 000	....	....
1859	12, 728, 900	70, 000	66, 100	....	38, 000	15, 000	$20, 000	....
1860	10, 899, 000	50, 000	106, 000	21, 000	89, 000	13, 000	....	....
1861	15, 360, 000	155, 000	90, 000	....	60, 000	....	....	....
1862	17, 083, 460	125, 000	47, 500	....	20, 000	....	....	....
1863	19, 331, 400	100, 000	85, 000	....	27, 000	....	....	....
1864	15, 873, 200	25, 000	19, 440	....	....	....	....	....
1865	20, 850, 000	167, 000	138, 060	....	58, 440	....	....	....
1866	16, 845, 000	200, 000	219, 600	....	97, 400	....	....	....
1867	18, 415, 000	90, 000	145, 000	....	70, 000	....	....	....
1868	16, 750, 000	135, 000	260, 000	....	85, 000	....	....	....
1869	13, 785, 000	64, 300	155, 000	....	73, 750	....	....	....
1870	19, 640, 000	80, 000	85, 000	....	40, 000	3, 000	....	....
1871	18, 560, 000	165, 000	125, 000	....	55, 000	....	....	....
1872	15, 600, 000	173, 000	182, 000	....	45, 000	....	9, 000	....
1873	20, 812, 000	120, 000	155, 000	....	67, 500	....	700	$703, 000
1874	24, 280, 000	100, 000	80, 000	....	....	....	....	2, 549, 000
1875	24, 600, 000	....	45, 000	....	29, 000	....	....	4, 487, 000
1876	31, 940, 000	50, 000	20, 000	....	12, 500	....	....	5, 227, 000
1877	34, 700, 000	170, 000	133, 500	....	88, 500	....	....	9, 519, 000
1878	34, 780, 000	261, 000	723, 500	....	445, 000	....	9, 774, 000	4, 162, 000
1879	24, 476, 000	2, 240, 000	2, 131, 000	....	108, 750	....	9, 110, 000	....
1880	16, 720, 000	5, 062, 500	6, 744, 500	....	....	....	8, 900, 000	....
1881	14, 540, 000	9, 700, 000	4, 845, 000	....	....	....	12, 760, 000	....
1882	22, 500, 000	1, 320, 000	4, 845, 000	....	....	....	9, 250, 000	....
1883	23, 780, 000	380, 000	416, 000	....	....	....	6, 250, 000	....
1884	18, 320, 000	1, 242, 500	885, 000	....	....	....	3, 200, 000	....
1885	13, 670, 000	2, 280, 000	6, 057, 500	....	....	....	1, 497, 000	....
1886	....	8, 260, 000	16, 340, 000	....	....	....	750, 000	....
1887	5, 660, 000	8, 170, 000	9, 560, 000	....	....	....	1, 771, 000	....
1888	17, 192, 000	6, 487, 000	1, 469, 500	....	....	....	657, 000	....
1889	15, 494, 000	4, 254, 000	....	....	....	....	700, 000	....
1890	16, 055, 000	....	....	....	....	....	8, 230, 373	....
1891	25, 762, 500	....	....	....	....	....	5, 296, 000	....
1892	18, 603, 000	1, 155, 000	1, 492, 000	....	....	....	1, 200, 000	....
1893	19, 923, 500	1, 413, 500	1, 120, 000	....	....	....	100, 000	....
1894	20, 971, 000	250, 000	279, 500	....	....	....	1, 260, 000	....
1895	22, 870, 000	490, 000	560, 000	....	....	....	400, 000	....
1896	28, 078, 500	1, 237, 500	777, 000	....	....	....	5, 000, 000	....
1897	29, 405, 000	2, 347, 500	1, 770, 000	....	....	....	5, 825, 000	....
1898	51, 503, 500	4, 736, 000	6, 987, 000	....	....	....	4, 102, 000	....
1899	40, 206, 000	8, 410, 000	7, 725, 000	....	....	....	2, 562, 000	....
1900	49, 190, 000	810, 000	1, 645, 000	....	....	....	3, 540, 000	....
1901	31, 920, 000	28, 127, 500	18, 240, 000	....	....	....	2, 284, 000	....
1902	35, 072, 500	4, 695, 000	4, 695, 000	....	....	....	1, 530, 000	....
Total	1,045,257,520	107,754,560	102,824,540	186, 300	1, 861, 255	90, 232	105,978,073	26, 647, 000

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

from its organization, 1854, to December 31, 1902.]

SILVER.					TOTAL COINAGE.		TOTAL VALUE.
Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Gold.	Silver.	
....	....	....	....	....	$4,084,207	....	$4,084,207.00
$64,975.00	$99,100.00	....	....	....	18,008,300	$164,075.00	18,172,375.00
105,500.00	71,500.00	....	$7,000.00	....	25,306,400	184,000.00	25,490,400.00
79,000.00	20,500.00	....	....	....	20,327,000	99,500.00	20,426,500.00
238,000.00	30,250.00	....	6,000.00	....	17,158,200	274,250.00	17,432,450.00
283,000.00	20,000.00	....	6,000.00	....	12,918,000	329,000.00	13,247,000.00
236,000.00	14,000.00	....	14,000.00	....	11,178,000	264,000.00	11,442,000.00
469,750.00	24,000.00	....	17,250.00	....	15,665,000	511,000.00	16,176,000.00
676,000.00	16,750.00	....	18,075.00	....	17,275,960	710,825.00	17,986,785.00
458,000.00	....	....	15,750.00	$5,000	19,543,400	478,750.00	20,022,150.00
329,000.00	5,000.00	....	23,000.00	4,500	15,917,640	361,500.00	16,279,140.00
337,500.00	10,250.00	....	17,500.00	6,000	21,213,500	371,250.00	21,584,750.00
527,000.00	7,000.00	....	13,500.00	6,000	17,362,000	553,500.00	17,915,500.00
598,000.00	12,000.00	....	14,000.00	6,000	18,720,000	630,000.00	19,350,000.00
580,000.00	24,000.00	....	26,000.00	14,000	17,230,000	644,000.00	17,874,000.00
328,000.00	19,000.00	....	45,000.00	11,500	14,028,050	403,500.00	14,431,550.00
502,000.00	....	....	5,000.00	....	19,848,000	507,000.00	20,355,000.00
1,089,000.00	7,725.00	....	32,000.00	8,050	18,905,000	1,136,775.00	20,041,775.00
290,000.00	20,750.00	....	19,000.00	41,850	16,000,000	380,600.00	16,380,600.00
116,500.00	39,000.00	....	45,500.00	16,200	21,154,500	920,900.00	22,075,400.00
197,000.00	98,000.00	....	24,000.00	....	24,460,000	2,868,000.00	27,328,000.00
1,600,000.00	170,000.00	$231,000	907,000.00	....	24,674,000	7,395,000.00	32,069,000.00
2,264,000.00	2,149,000.00	....	1,042,000.00	....	32,022,500	10,682,000.00	42,704,500.00
2,678,000.00	2,249,000.00	....	234,000.00	....	35,092,000	14,680,000.00	49,772,000.00
6,000.00	35,000.00	....	....	....	36,209,500	13,977,000.00	50,186,500.00
....	....	....	....	....	28,955,750	9,110,000.00	38,065,750.00
....	....	....	....	....	28,527,000	8,900,000.00	37,427,000.00
....	....	....	....	....	29,085,000	12,760,000.00	41,845,000.00
....	....	....	....	....	28,665,000	9,250,000.00	37,915,000.00
....	....	....	....	....	24,576,000	6,250,000.00	30,826,000.00
....	....	....	56,496.90	....	20,447,500	3,256,496.90	23,703,996.90
....	....	....	4,369.00	....	22,007,500	1,501,369.00	23,508,869.00
....	....	....	20,652.40	....	24,600,000	770,652.40	25,370,652.40
....	....	....	445,445.00	....	23,390,000	2,216,445.00	25,606,445.00
....	304,000.00	....	172,000.00	....	25,148,500	1,133,000.00	26,281,500.00
....	....	....	97,267.80	....	19,748,000	797,267.80	20,545,267.80
....	....	....	142,307.60	....	16,055,000	8,372,680.60	24,427,680.60
....	554,000.00	....	319,611.60	....	25,762,500	6,169,611.60	31,932,111.60
514,514.00	241,019.75	....	99,071.00	....	21,250,000	2,054,604.75	23,304,604.75
370,000.00	363,633.75	....	249,140.10	....	22,457,000	1,082,773.85	23,539,773.85
2,024,345.00	662,205.25	....	2.40	....	21,500,500	3,946,552.65	25,447,052.65
554,043.00	441,170.25	....	112,000.00	....	23,920,000	1,507,213.25	25,427,213.25
570,474.00	47,009.75	....	57,505.60	....	30,093,000	5,674,989.35	35,767,989.35
466,950.00	135,557.25	....	134,284.40	....	33,522,500	6,561,791.65	40,084,291.65
1,179,275.00	255,148.00	....	170,250.70	....	63,226,500	5,706,673.70	68,933,173.70
843,205.50	177,000.00	....	186,749.30	....	56,341,000	3,768,954.80	60,109,954.80
1,280,161.00	464,646.25	....	516,827.00	....	51,645,000	5,801,634.25	57,446,634.25
423,522.00	18,166.00	....	59,302.20	....	78,287,500	2,784,990.20	81,072,490.20
730,335.00	381,153.00	....	207,000.00	....	44,462,500	2,848,488.00	47,310,988.00
23,009,049.50	9,186,534.25	231,000	5,581,858.00	119,100	1,257,974,407	170,752,614.75	1,428,727,021.75

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

[Coinage of the mint at New Orleans from its organization, 1838, to

Calendar years.	GOLD.						SILVER.
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.	Dollars.
1838							
1839					$44,452.50		
1840			$152,000		65,500.00		
1841		$25,000	41,750		18,450.00		
1842		274,000	82,000		49,500.00		
1843		1,751,620	505,375		920,005.00		
1844		1,187,000	1,823,000				
1845		475,000	205,000				
1846		817,800	290,000		165,000.00		$59,000
1847		5,715,000	60,000		310,000.00		
1848		358,500					
1849		239,000				$215,000	
1850	$2,820,000	575,000			210,000.00	14,000	40,000
1851	6,300,000	2,630,000	205,000		370,000.00	290,000	
1852	3,800,000	180,000			350,000.00	140,000	
1853	1,420,000	510,000				290,000	
1854	65,000	525,000	230,000	$72,000	382,500.00		
1855	160,000	180,000	55,500			55,000	
1856	45,000	145,000	50,000		52,750.00		
1857	600,000	55,000	65,000		85,000.00		
1858	705,000	200,000					
1859	182,000	23,000					360,000
1860	132,000	111,000					515,000
1861 [a]	100,000						
1879	46,500	15,000					2,887,000
1880		92,000					5,305,000
1881		83,500					5,708,000
1882		108,200					6,090,000
1883		8,000					8,725,000
1884							9,730,000
1885							9,185,000
1886							10,710,000
1887							11,550,000
1888		213,350					12,150,000
1889							11,875,000
1890							10,701,000
1891							7,954,529
1892		286,880	50,000				2,744,000
1893		170,000	550,000				300,000
1894		1,075,000	83,000				1,723,000
1895		980,000					450,000
1896							4,900,000
1897		425,000					4,004,000
1898							4,440,000
1899		370,470					12,290,000
1900							12,590,000
1901		720,410					13,320,000
1902							8,636,000
Total	16,375,500	20,524,730	4,447,625	72,000	3,023,157.50	1,004,000	178,941,529

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[a] No coinage from 1862 to 1878, inclusive.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

its suspension, 1861, and from its reopening, 1879, to December 31, 1902.]

SILVER.					TOTAL COINAGE.		TOTAL VALUE.
Half dollars.	Quarter dollars.	Dimes.	Half dimes.	Three cents.	Gold.	Silver.	
		$40,243.40				$40,243.40	$40,243.40
$81,488		124,327.20	$54,827.50		$44,452.50	260,642.70	305,095.20
427,550	$106,300	117,500.00	46,750.00		217,500.00	698,100.00	915,600.00
200,500	113,000	200,750.00	40,750.00		85,200.00	555,000.00	640,200.00
478,500	192,250	202,000.00	17,500.00		405,500.00	890,250.00	1,295,750.00
1,134,000	242,000	15,000.00			3,177,000.00	1,391,000.00	4,568,000.00
1,002,500	185,000		11,000.00		3,010,000.00	1,198,500.00	4,208,500.00
1,047,000		23,000.00			680,000.00	1,070,000.00	1,750,000.00
1,152,000					1,272,800.00	1,211,000.00	2,483,800.00
1,292,000	92,000				6,085,000.00	1,384,000.00	7,469,000.00
1,590,000			30,000.00		358,500.00	1,620,000.00	1,978,500.00
1,155,000		30,000.00	7,000.00		454,000.00	1,192,000.00	1,646,000.00
1,228,000	103,000	51,000.00	34,500.00		3,619,000.00	1,456,500.00	5,075,500.00
201,000	22,000	40,000.00	43,000.00	$21,600	9,795,000.00	327,600.00	10,122,600.00
72,000	24,000	43,000.00	13,000.00		4,470,000.00	152,000.00	4,622,000.00
664,000	333,000	110,000.00	118,000.00		2,220,000.00	1,225,000.00	3,445,000.00
2,620,000	371,000	177,000.00	78,000.00		1,274,500.00	3,246,000.00	4,520,500.00
1,844,000	44,000		30,000.00		450,500.00	1,918,000.00	2,368,500.00
1,329,000	242,000	118,000.00	55,000.00		292,750.00	1,744,000.00	2,036,750.00
409,000	295,000	154,000.00	69,000.00		805.000.00	927,000.00	1,732,000.00
3,647,000	130,000	29,000.00	83,000.00		905,000.00	3,889,000.00	4,794,000.00
1,417,000	65,000	48,000.00	28,000.00		205,000.00	1,918,000.00	2,123,000.00
645,000	97,000	4,000.00	53,000.00		243,000.00	1,314,000.00	1,557,000.00
165,000					100,000.00	165,000.00	265,000.00
					61,500.00	2,887,000.00	2,948,500.00
					92,000.00	5,305,000.00	5,397,000.00
					83,500.00	5,708,000.00	5,791,500.00
					108,200.00	6,090,000.00	6,198,200.00
					8,000.00	8,725,000.00	8,733,000.00
						9,730,000.00	9,730,000.00
						9,185,000.00	9,185,000.00
						10,710,000.00	10,710,000.00
						11,550,000.00	11,550,000.00
					213,350.00	12,150,000.00	12,363,350.00
						11,875,000.00	11,875,000.00
						10,701,000.00	10,701,000.00
	17,000	454,000.00				8,425,529.00	8,425,529.00
195,000	660,000	384,170.00			336,880.00	3,983,170.00	4,320,050.00
694,500	849,000	176,000.00			720,000.00	2,019,500.00	2,739,500.00
1,069,000	713,000	72,000.00			1,158,000.00	3,577,000.00	4,735,000.00
883,000	704,000	44,000.00			980,000.00	2,081,000.00	3,061,000.00
462,000	371,000	61,000.00				5,794,000.00	5,794,000.00
316,000	353,700	66,600.00			425,000.00	4,740,300.00	5,165,300.00
437,000	467,000	213,000.00				5,557,000.00	5,557,000.00
862,000	661,000	265,000.00			370,470.00	14,078,000.00	14,448,470.00
1,372,000	854,000	201,000.00				15,017,000.00	15,017,000.00
562,000	403,000	562,000.00			720,410.00	14,847,000.00	15,567,410.00
1,263,000	1,187,000	450,000.00				11,536,000.00	11,536,000.00
31,917,038	9,896,250	4,475,590.60	812,327.50	21,600	45,447,012.50	226,064,335.10	271,511,347.60

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

[Coinage of the mint at Carson City,

Calendar years.	GOLD.			SILVER.	
	Double eagles.	Eagles.	Half eagles.	Dollars.	Trade dollars.
1870	$75,780	$59,080	$38,375	$12,462	
1871	293,740	71,850	103,850	1,376	
1872	593,000	55,000	84,900	3,150	
1873	448,200	45,430	37,080	2,300	$124,500
1874	2,301,700	167,670	105,990		1,373,200
1875	2,223,020	77,150	59,140		1,573,700
1876	2,768,820	46,960	34,435		509,000
1877	851,300	33,320	43,400		534,000
1878	263,600	32,440	45,270	2,212,000	97,000
1879	214,160	17,620	86,405	756,000	
1880		111,900	255,085	591,000	
1881		240,150	69,430	296,000	
1882	782,800	67,640	414,085	1,133,000	
1883	1,199,240	120,000	64,790	1,204,000	
1884	1,622,780	99,250	82,010	1,136,000	
1885	189,000			228,000	
1886 [a]					
1887 [a]					
1888 [a]					
1889 [b]	618,900			350,000	
1890	1,824,180	175,000	269,000	2,309,041	
1891	100,000	1,037,320	1,040,000	1,618,000	
1392	545,300	400,000	414,840	1,352,000	
1893 [c]	368,040	140,000	300,000	677,000	
Total	17,283,560	2,997,780	3,548,085	13,881,329	4,211,400

[a] Coinage suspended.

[b] Operations resumed October 1, 1889.

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

[Coinage of the mint at Charlotte, N. C., from its organization, 1838, to its suspension, 1861.]

Calendar years.	GOLD.			TOTAL VALUE.
	Half eagles.	Quarter eagles.	Dollars.	
1838	$64,565	$19,770.00		$84,335.00
1839	117,335	45,432.50		162,767.50
1840	95,140	32,095.00		127,235.00
1841	107,555	25,742.50		133,297.50
1842	137,400	16,842.50		154,242.50
1843	221,765	65,240.00		287,005.00
1844 [a]	118,155	29,055.00		147,210.00
1845 [b]				
1846	64,975	12,020.00		76,995.00
1847	420,755	58,065.00		478,820.00
1848	322,360	41,970.00		364,330.00
1849	324,115	25,550.00	11,634	361,299.00
1850	317,955	22,870.00	6,966	347,791.00
1851	245,880	37,307.50	41,267	324,454.50
1852	362,870	24,430.00	9,434	396,734.00
1853	327,855		11,515	339,370.00
1854	196,455	18,237.50	4	214,696.50
1855	198,940	9,192.50	9,803	217,935.50
1856	142,285	19,782.50		162,067.50
1857	156,800		13,280	170,080.00
1858	194,280	22,640.00		216,920.00
1859	159,235		5,235	164,470.00
1860	74,065	18,672.50		92,737.50
1861	34,395			34,395.00
Total	4,405,135	544,915.00	109,138	5,059,188.00

[a] Mint burned July 27, 1844.

[b] No coinage.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

from its organization, 1870, to June 30, 1893.]

SILVER.				TOTAL COINAGE.		TOTAL VALUE.
Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Gold.	Silver.	
$27,308.50	$2,085.00			$173,235	$41,855.50	$215,090.50
69,975.00	2,722.50		$2,010.00	469,440	76,083.50	545,523.50
136,000.00	2,275.00		2,400.00	732,900	143,825.00	876,725.00
168,530.00	4,115.50		3,119.10	530,710	302,564.60	833,274.60
29,500.00			1,081.70	2,575,360	1,403,781.70	3,979,141.70
504,000.00	35,000.00	$26,658	464,500.00	2,359,310	2,603,858.00	4,963,168.00
978,000.00	1,236,000.00	2,000	827,000.00	2,850,215	3,552,000.00	6,402,215.00
710,000.00	1,048,000.00		770,000.00	928,020	3,062,000.00	3,990,020.00
31,000.00	249,000.00		20,000.00	341,310	2,609,000.00	2,950,310.00
				318,185	756,000.00	1,074,185.00
				366,985	591,000.00	957,985.00
				309,580	296,000.00	605,580.00
				1,264,525	1,133,000.00	2,397,525.00
				1,384,030	1,204,000.00	2,588,030.00
				1,804,040	1,136,000.00	2,940,040.00
				189,000	228,000.00	417,000.00
				618,900	350,000.00	968,900.00
				2,268,180	2,309,041.00	4,577,221.00
				2,177,320	1,618,000.00	3,795,320.00
				1,360,140	1,352,000.00	2,712,140.00
				808,040	677,000.00	1,485,040.00
2,654,313.50	2,579,198.00	28,658	2,090,110.80	23,829,425	25,445,009.30	49,274,434.30

[c] Coinage suspended from May 23, 1893.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

[Coinage of the mint at Dahlonega, Ga., from its organization, 1838, to its suspension, 1861.]

Calendar years.	GOLD.				TOTAL VALUE.
	Half eagles.	Three dollars.	Quarter eagles.	Dollars.	
1838	$102,915				$102,915.00
1839	94,695		$34,185.00		128,880.00
1840	114,480		8,830.00		123,310.00
1841	152,475		10,410.00		162,885.00
1842	298,040		11,607.50		309,647.50
1843	492,260		90,522.50		582,782.50
1844	444,910		43,330.00		488,240.00
1845	453,145		48,650.00		501,795.00
1846	401,470		48,257.50		449,727.50
1847	322,025		39,460.00		361,485.00
1848	237,325		34,427.50		271,752.50
1849	195,180		27,362.50	$21,588	244,130.50
1850	219,750		30,370.00	8,382	258,502.00
1851	313,550		28,160.00	9,882	351,592.00
1852	457,260		10,195.00	6,360	473,815.00
1853	448,390		7,945.00	6,583	462,918.00
1854	282,065	$3,360	4,400.00	2,935	292,760.00
1855	112,160		2,807.50	1,811	116,778.50
1856	98,930		2,185.00	1,460	102,575.00
1857	85,230		5,910.00	3,533	94,673.00
1858	76,810			3,477	80,287.00
1359	51,830		5,610.00	4,952	62,392.00
1860	73,175			1,566	74,741.00
1861	7,985				7,985.00
Total	5,536,055	3,360	494,625.00	72,529	6,106,569.00

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

RECAPITULATION.

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.*	Half eagles.	Three dollars.	Quarter eagles.	Dollars.
1793–95	.....	$27,950	$43,535	.....	.....	.....
1796	.....	60,800	16,995	.....	$165.00	.....
1797	.....	91,770	32,030	.....	4,390.00	.....
1798	.....	79,740	124,335	.....	1,535.00	.....
1799	.....	174,830	37,255	.....	1,200.00	.....
1800	.....	259,650	58,110	.....	.....	.....
1801	.....	292,540	130,030	.....	.....	.....
1802	.....	150,900	265,880	.....	6,530.00	.....
1803	.....	89,790	167,530	.....	1,057.50	.....
1804	.....	97,950	152,375	.....	8,317.50	.....
1805	.....	.....	165,915	.....	4,452.50	.....
1806	.....	.....	320,465	.....	4,040.00	.....
1807	.....	.....	420,465	.....	17,030.00	.....
1808	.....	.....	277,890	.....	6,775.00	.....
1809	.....	.....	169,375	.....	.....	.....
1810	.....	.....	501,435	.....	.....	.....
1811	.....	.....	497,905	.....	.....	.....
1812	.....	.....	290,435	.....	.....	.....
1813	.....	.....	477,140	.....	.....	.....
1814	.....	.....	77,270	.....	.....	.....
1815	.....	.....	3,175	.....	.....	.....
1816	.....	.....	.....	.....	.....	.....
1817	.....	.....	.....	.....	.....	.....
1818	.....	.....	242,940	.....	.....	.....
1819	.....	.....	258,615	.....	.....	.....
1820	.....	.....	1,319,030	.....	.....	.....
1821	.....	.....	173,205	.....	16,120.00	.....
1822	.....	.....	88,980	.....	.....	.....
1823	.....	.....	72,425	.....	.....	.....
1824	.....	.....	86,700	.....	6,500.00	.....
1825	.....	.....	145,300	.....	11,085.00	.....
1826	.....	.....	90,345	.....	1,900.00	.....
1827	.....	.....	124,565	.....	7,000.00	.....
1828	.....	.....	140,145	.....	.....	.....
1829	.....	.....	287,210	.....	8,507.50	.....
1830	.....	.....	631,755	.....	11,350.00	.....
1831	.....	.....	702,970	.....	11,300.00	.....
1832	.....	.....	787,435	.....	11,000.00	.....
1833	.....	.....	968,150	.....	10,400.00	.....
1834	.....	.....	3,660,845	.....	293,425.00	.....
1835	.....	.....	1,857,670	.....	328,505.00	.....
1836	.....	.....	2,765,735	.....	1,369,965.00	.....
1837	.....	.....	1,035,605	.....	112,700.00	.....
1838	.....	72,000	1,600,420	.....	137,345.00	.....
1839	.....	382,480	802,745	.....	191,622.50	.....
1840	.....	473,380	1,048,530	.....	153,572.50	.....
1841	.....	656,310	380,945	.....	54,602.50	.....
1842	.....	1,089,070	655,330	.....	85,007.50	.....
1843	.....	2,506,240	4,275,425	.....	1,327,132.50	.....
1844	.....	1,250,610	4,087,715	.....	89,345.00	.....
1845	.....	736,530	2,743,640	.....	276,277.50	.....
1846	.....	1,018,750	2,736,155	.....	279,272.50	.....
1847	.....	14,337,580	5,382,685	.....	482,060.00	.....
1848	.....	1,813,340	1,863,560	.....	98,612.50	.....
1849	.....	6,775,180	1,184,645	.....	111,147.50	$936,789
1850	$26,225,220	3,489,510	860,160	.....	895,547.50	511,301
1851	48,043,100	4,393,280	2,651,955	.....	3,867,337.50	3,658,820
1852	44,860,520	2,811,060	3,689,635	.....	3,283,827.50	2,201,145
1853	26,646,520	2,522,530	2,305,095	.....	3,519,615.00	4,384,149
1854	18,052,340	2,305,760	1,513,235	$491,214	1,896,397.50	1,657,016
1855	25,046,820	1,487,010	1,257,090	171,465	600,700.00	824,883
1856	30,437,560	1,429,900	1,806,665	181,530	1,213,117.50	1,788,996
1857	28,797,500	481,060	1,232,970	104,673	796,235.00	801,602
1858	21,873,480	343,210	439,770	6,399	144,082.50	131,472
1859	13,782,840	253,930	361,235	46,914	142,220.00	193,431
1860	22,584,400	278,830	352,365	42,465	164,360.00	51,234
1861	74,989,060	1,287,330	3,332,130	18,216	3,241,295.00	527,499
1862	18,926,120	234,950	69,825	17,355	300,882.50	1,326,865
1863	22,187,200	112,480	97,360	15,117	27,075.00	6,250
1864	19,958,900	60,800	40,540	8,040	7,185.00	5,950
1865	27,874,000	207,050	144,535	3,495	62,302.50	3,725
1866	30,820,500	237,800	253,200	12,090	105,175.00	7,180
1867	23,436,300	121,400	179,600	7,950	78,125.00	5,250
1868	18,722,000	241,550	288,625	14,625	94,062.50	10,525
1869	17,238,100	82,850	163,925	7,575	84,612.50	5,925
Carried forward	560,502,480	54,819,680	67,470,880	1,149,123	26,065,402.50	19,040,007

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION.

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
....	$204,791	$161,572.00	....	....	....	$4,320.80	....
....	72,920	....	$1,473.50	....	$2,213.50	511.50	....
....	7,776	1,959.00	63.00	....	2,526.10	2,226.35	....
....	327,536	....	....	....	2,755.00	....	....
....	423,515	....	....	....	....	....	....
....	220,920	....	....	....	2,176.00	1,200.00	....
....	54,454	15,144.50	....	....	3,464.00	1,695.50	....
....	41,650	14,945.00	....	....	1,097.50	650.50	....
....	66,064	15,857.50	....	....	3,304.00	1,892.50	....
....	19,570	78,259.50	1,684.50	....	826.50	....	....
....	321	105,861.00	30,348.50	....	12,078.00	780.00	....
....	....	419,788.00	51,531.00	....	....	....	....
....	....	525,788.00	55,160.75	....	16,500.00	....	....
....	....	684,300.00	....	....	....	....	....
....	....	702,905.00	....	....	4,471.00	....	....
....	....	638,138.00	....	....	635.50	....	....
....	....	601,822.00	....	....	6,518.00	....	....
....	....	814,029.50	....	....	....	....	....
....	....	620,951.50	....	....	....	....	....
....	....	519,537.50	....	....	42,150.00	....	....
....	....	....	17,308.00	....	....	....	....
....	....	23,575.00	5,000.75	....	....	....	....
....	....	607,783.50	....	....	....	....	....
....	....	980,161.00	90,293.50	....	....	....	....
....	....	1,104,000.00	36,000.00	....	....	....	....
....	....	375,561.00	31,861.00	....	94,258.70	....	....
....	....	652,898.50	54,212.75	....	118,651.20	....	....
....	....	779,786.50	16,020.00	....	10,000.00	....	....
....	....	847,100.00	4,450.00	....	44,000.00	....	....
....	....	1,752,477.00	....	....	....	....	....
....	....	1,471,583.00	42,000.00	....	51,000.00	....	....
....	....	2,002,090.00	....	....	....	....	....
....	....	2,746,700.00	1,000.00	....	121,500.00	....	....
....	....	1,537,600.00	25,500.00	....	12,500.00	....	....
....	....	1,856,078.00	....	....	77,000.00	61,500.00	....
....	....	2,382,400.00	....	....	51,000.00	62,000.00	....
....	....	2,936,830.00	99,500.00	....	77,135.00	62,135.00	....
....	....	2,398,500.00	80,000.00	....	52,250.00	48,250.00	....
....	....	2,603,000.00	39,000.00	....	48,500.00	68,500.00	....
....	....	3,206,002.00	71,500.00	....	63,500.00	74,000.00	....
....	....	2,676,003.00	488,000.00	....	141,000.00	138,000.00	....
....	1,000	3,273,100.00	118,000.00	....	119,000.00	95,000.00	....
....	....	1,814,910.00	63,100.00	....	104,200.00	113,800.00	....
....	....	1,773,000.00	208,000.00	....	239,493.40	112,750.00	....
....	300	1,748,768.00	122,786.50	....	229,638.70	108,285.00	....
....	61,005	1,145,054.00	153,331.75	....	253,358.00	113,954.25	....
....	173,000	355,500.00	143,000.00	....	363,000.00	98,250.00	....
....	184,618	1,484,882.00	214,250.00	....	390,750.00	58,250.00	....
....	165,100	3,056,000.00	403,400.00	....	152,000.00	58,250.00	....
....	20,000	1,885,500.00	290,300.00	....	7,250.00	32,500.00	....
....	24,500	1,341,500.00	230,500.00	....	198,500.00	78,200.00	....
....	169,600	2,257,000.00	127,500.00	....	3,130.00	1,350.00	....
....	140,750	1,870,000.00	275,500.00	....	24,500.00	63,700.00	....
....	15,000	1,880,000.00	36,500.00	....	45,150.00	63,400.00	....
....	62,600	1,781,000.00	85,000.00	....	113,900.00	72,450.00	....
....	47,500	1,341,500.00	150,700.00	....	244,150.00	82,250.00	....
....	1,300	301,375.00	62,000.00	....	142,650.00	82,050.00	$185,022.00
....	1,100	110,565,00	68,265.00	....	196,550.00	63,025.00	559,905.00
....	46,110	2,430,354.00	4,146,555.00	....	1,327,301.00	785,251.00	342,000.00
....	33,140	4,111,000.00	3,466,000.00	....	624,000.00	365,000.00	20,130.00
....	26,000	2,288,725.00	857,350.00	....	207,500.00	117,500.00	4,170.00
....	63,500	1,903,500.00	2,129,500.00	....	703,000.00	299,000.00	43,740.00
....	94,000	1,482,000.00	2,726,500.00	....	712,000.00	433,000.00	31,260.00
....	....	5,998,000.00	2,002,250.00	....	189,000.00	258,000.00	48,120.00
....	636,500	2,074,000.00	421,000.00	....	97,000.00	45,000.00	10,950.00
....	733,930	1,032,850.00	312,350.00	....	78,700.00	92,950.00	8,610.00
....	78,500	2,078,950.00	1,237,650.00	....	209,650.00	164,050.00	14,940.00
....	12,090	802,175.00	249,887.50	....	102,830.00	74,627.50	10,906.50
....	27,660	709,830.00	48,015.00	....	17,196.00	5,923.00	643.80
....	31,170	518,785.00	28,517.50	....	26,907.00	4,523.50	14.10
....	47,000	593,450.00	25,075.00	....	18,550.00	6,675.00	255.00
....	49,625	899,812.50	11,381.25	....	14,372.50	6,536.25	681.75
....	60,325	810,162.50	17,156.25	....	14,662.50	6,431.25	138.75
....	182,700	769,100.00	31,500.00	....	72,625.00	18,295.00	123.00
....	424,300	725,950.00	23,150.00	....	70,660.00	21,930.00	153.00
....	5,053,440	95,509,284.50	21,727,878.00	....	8,376,184.10	4,529,818.90	1,281,762.90

XXIX.—COINAGE OF THE MINTS OF THE UNITED STATES

RECAPITULATION—Continued.

Calendar years.	GOLD COINAGE.					
	Double eagles.	Eagles.	Half eagles.	Three dollars.	Quarter eagles.	Dollars.
Brought forward	$560,502,480	$54,819,680	$67,470,880	$1,149,123	$26,065,402.50	$19,040,007
1870	22,819,480	164,430	143,550	10,605	51,387.50	9,335
1871	20,456,740	254,650	245,000	3,990	68,375.00	3,930
1872	21,230,600	244,500	275,350	6,090	52,575.00	3,530
1873	55,456,700	173,680	754,605	75	512,562.50	125,125
1874	33,917,700	799,270	203,530	125,460	9,850.00	198,820
1875	32,737,820	78,350	105,240	60	30,050.00	420
1876	46,386,920	104,280	61,820	135	23,052.50	3,245
1877	43,504,700	211,490	182,660	4,464	92,630.00	3,920
1878	45,916,500	1,031,440	1,427,470	246,972	1,160,650.00	3,020
1879	28,889,260	6,120,320	3,727,155	9,090	331,225.00	3,030
1880	17,749,120	21,715,160	22,831,765	3,108	7,490.00	1,636
1881	14,585,200	48,796,250	33,458,430	1,650	1,700.00	7,660
1882	23,295,400	24,740,640	17,831,885	4,620	10,100.00	5,040
1883	24,980,040	2,595,400	1,647,990	2,820	4,900.00	10,840
1884	19,944,200	2,110,800	1,922,250	3,318	4,982.50	6,206
1885	13,875,560	4,815,270	9,065,030	2,730	2,217.50	12,205
1886	22,120	10,621,600	18,282,160	3,426	10,220.00	6,016
1887	5,662,420	8,706,800	9,560,435	18,480	15,705.00	8,543
1888	21,717,320	8,030,310	1,560,980	15,873	40,245.00	16,080
1889	16,995,120	4,298,850	37,825	7,287	44,120.00	30,729
1890	19,399,080	755,430	290,640	....	22,032.50	....
1891	25,891,340	1,956,000	1,347,065	....	27,600.00	....
1892	19,238,760	9,817,400	5,724,700	....	6,362.50	....
1893	27,178,320	20,132,450	9,610,985	....	75,265.00	....
1894	48,350,800	26,032,780	5,152,275	....	10,305.00	....
1895	45,163,120	7,148,260	7,289,680	....	15,297.50	....
1896	43,931,760	2,000,980	1,072,315	....	48,005.00	....
1897	57,070,220	12,774,090	6,109,415	....	74,760.00	....
1898	54,912,900	12,857,970	10,154,475	....	60,412.50	....
1899	73,593,680	21,403,520	16,278,645	....	68,375.00	....
1900	86,681,680	3,749,600	8,673,650	....	168,012 50	....
1901	34,150,520	46,036,160	21,320,200	....	228,307.50	....
1902	35,697,580	5,520,130	5,557,810	....	334,332.50	[c] 75,080
Total	1,641,905,160	370,617,940	289,377,865	1,619,376	29,678,507.50	19,574,417

[a] Includes $475,000 in Columbian coins. [b] Includes $2,026,052.50 in Columbian coins.

[c] Louisiana Purchase Exposition.

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION—Continued.

SILVER COINAGE.							
Trade dollars.	Dollars.	Half dollars.	Quarter dollars.	Twenty cents.	Dimes.	Half dimes.	Three cents.
....	$5,053,440	$95,509,284.50	$21,727,878.00	....	$8,376,184.10	$4,529,818.90	$1,281,762.90
....	445,462	829,758.50	23,935.00	....	52,150.00	26,830.00	120.00
....	1,117,136	1,741,655.00	53,255.50	....	109,371.00	82,493.00	127.80
....	1,118,600	866,775.00	68,762.50	....	261,045.00	189,247.50	58.50
$1,225,000	296,600	1,593,780.00	414,190.50	....	443,329.10	51,830.00	18.00
4,910,000	....	1,406,650.00	215,975.00	....	319,151.70	....	....
6,279,600	....	5,117,750.00	1,278,375.00	$265,598	2,406,570.00	....	....
6,192,150	....	7,451,575.00	7,839,287.50	5,180	3,015,115.00	....	....
13,092,710	....	7,540,255.00	6,024,927.50	102	1,735,051.00	....	....
4,259,900	22,495,550	726,200.00	849,200.00	120	187,880.00	....	....
1,541	27,560,100	2,950.00	3,675.00	....	1,510.00	....	....
1,987	27,397,355	4,877.50	3,738.75	....	3,735.50	....	....
960	27,927,975	5,487.50	3,243.75	....	2,497.50	....	....
1,097	27,574,100	2,750.00	4,075.00	....	391,110.00	....	....
979	28,470,039	4,519.50	3,859.75	....	767,571.20	....	....
....	28,136,875	2,637.50	2,218.75	....	393,134.90	....	....
....	28,697,767	3,065.00	3,632.50	....	257,711.70	....	....
....	31,423,886	2,943.00	1,471.50	....	658,409.40	....	....
....	33,611,710	2,855.00	2,677.50	....	1,573,838.90	....	....
....	31,990,833	6,416.50	306,708.25	....	721,648.70	....	....
....	34,651,811	6,355.50	3,177.75	....	835,338.90	....	....
....	38,043,004	6,295.00	20,147.50	....	1,133,461.70	....	....
....	23,562,735	100,300.00	1,551,150.00	....	2,304,671.60	....	....
....	6,333,245	[a]1,652,136.50	2,960,331.00	....	1,695,365.50	....	....
....	1,455,792	[b]4,003,948.50	[c]2,583,837.50	....	759,219.30	....	....
....	3,093,972	3,667,831.00	2,233,448.25	....	205,099.60	....	....
....	862,880	2,354,652.00	2,255,390.25	....	225,088.00	....	....
....	19,876,762	1,507,855.00	1,386,700.25	....	318,581.80	....	....
....	12,651,731	2,023,315.50	2,524,440.00	....	1,287,810.80	....	....
....	14,426,735	3,094,642.50	3,497,331.75	....	2,015,324.20	....	....
....	15,182,846	4,474,628.50	3,994,211.50	....	2,409,833.90	....	....
....	[d]25,010,912	5,033,617.00	3,822,874.25	....	2,477,918.20	....	....
....	22,566,813	3,119,928.50	2,644,369.25	....	2,507,350.00	....	....
....	18,160,777	4,454,723.50	4,617,589.00	....	2,795,077.70	....	....
35,965,924	559,197,443	158,322,413.50	72,926,085.50	271,000	42,647,155.90	4,880,219.40	1,282,087.20

[c] Includes $10,005.75 in Columbian coins.

[d] Includes 50,000 Lafayette souvenir dollars.

XXIX.—Coinage of the Mints of the United States

RECAPITULATION—Continued.

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
1793–1795			
1796			
1797			
1798			
1799			
1800			
1801			
1802			
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1862			
1863			
1864			$396,950.00
1865		$341,460.00	272,800.00
1866	$737,125.00	144,030.00	63,540.00
1867	1,545,475.00	117,450.00	58,775.00
1868	1,440,850.00	97,560.00	56,075.00
1869	819,750.00	48,120.00	30,930.00
Carried forward	4,543,200.00	748,620.00	879,070.00

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION—Continued

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$10,660.33	$712.67	$71,485.00	$370,683.80	$11,373.00	$453,541.80
9,747.00	577.40	77,960.00	77,118.50	10,324.40	165,402.90
8,975.10	535.24	128,190.00	14,550.45	9,510.34	152,250.79
9,797.00	....	205,610.00	330,291.00	9,797.00	545,698.00
9,045.85	60.83	213,285.00	423,515.00	9,106.68	645,906.68
28,221.75	1,057.65	317,760.00	224,296.00	29,279.40	571,335.40
13,628.37	....	422,570.00	74,758.00	13,628.37	510,956.37
34,351.00	71.83	423,310.00	58,343.00	34,422.83	516,075.83
24,713.53	489.50	258,377.50	87,118.00	25,203.03	370,698.53
7,568.38	5,276.56	258,642.50	100,340.50	12,844.94	371,827.94
9,411.16	4,072.32	170,367.50	149,388.50	13,483.48	333 239.48
3,480.00	1,780.00	324,505.00	471,319.00	5,260.00	801,084.00
7,272.21	2,380.00	437,495.00	597,448.75	9,652.21	1,044,595.96
11,090.00	2,000.00	284,665.00	684,300.00	13,090.00	982,055.00
2,228.67	5,772.86	169,375.00	707,376.00	8,001.53	884,752.53
14,585.00	1,075.00	501,435.00	638,773.50	15,660.00	1,155,868.50
2,180.25	315.70	497,905.00	608,340.00	2,495.95	1,108,740.95
10,755.00	....	290,435.00	814,029.50	10,755.00	1,115,219.50
4,180.00	....	477,140.00	620,951.50	4,180.00	1,102,271.50
3,578.30	....	77,270.00	561,687.50	3,578.30	642,535.80
....	....	3,175.00	17,308.00	....	20,483.00
28,209.82	....	....	28,575.75	28,209.82	56,785.57
39,484.00	....	....	607,783.50	39,484.00	647,267.50
31,670.00	....	242,940.00	1,070,454.50	31,670.00	1,345,064.50
26,710.00	....	258,615.00	1,140,000.00	26,710.00	1,425,325.00
44,075.50	....	1,319,030.00	501,680.70	44,075.50	1,864,786.20
3,890.00	....	189,325.00	825,762.45	3,890.00	1,018,977.45
20,723.39	....	88,980.00	805,806.50	20,723.39	915,509.89
....	....	72,425.00	895,550.00	....	967,975.00
12,620.00	....	93,200.00	1,752,477.00	12,620.00	1,858,297.00
14,611.00	315.00	156,385.00	1,564,583.00	14,926.00	1,735,894.00
15,174.25	1,170.00	92,245.00	2,002,090.00	16,344.25	2,110,679.25
23,577.32	....	131,565.00	2,869,200.00	23,577.32	3,024,342.32
22,606.24	3,030.00	140,145.00	1,575,600.00	25,636.24	1,741,381.24
14,145.00	2,435.00	295,717.50	1,994,578.00	16,580.00	2,306,875.50
17,115.00	....	643,105.00	2,495,400.00	17,115.00	3,155,620.00
33,592.60	11.00	714,270.00	3,175,600.00	33,603.60	3,923,473.60
23,620.00	....	798,435.00	2,579,000.00	23,620.00	3,401,055.00
27,390.00	770.00	978,550.00	2,759,000.00	28,160.00	3,765,710.00
18,551.00	600.00	3,954,270.00	3,415,002.00	19,151.00	7,388,423.00
38,784.00	705.00	2,186,175.00	3,443,003.00	39,489.00	5,668,667.00
21,110.00	1,990.00	4,135,700.00	3,606,100.00	23,100.00	7,764,900.00
55,583.00	....	1,148,305.00	2,096,010.00	55,583.00	3,299,898.00
63,702.00	....	1,809,765.00	2,333,243.40	63,702.00	4,206,710.40
31,286.61	....	1,376,847.50	2,209,778.20	31,286.61	3,617,912.31
24,627.00	....	1,675,482.50	1,726,703.00	24,627.00	3,426,812.50
15,973.67	....	1,091,857.50	1,132,750.00	15,973.67	2,240,581.17
23,833.90	....	1,829,407.50	2,332,750.00	23,833.90	4,185,991.40
24,283.20	....	8,108,797.50	3,834,750.00	24,283.20	11,967,830.70
23,987.52	....	5,427,670.00	2,235,550.00	23,987.52	7,687,207.52
38,948.04	....	3,756,447.50	1,873,200.00	38,948.04	5,668,595.50
41,208.00	....	4,034,177.50	2,558,580.00	41,208.00	6,633.965.54
61,836.69	....	20,202,325.00	2,374,450.00	61,836.69	22,638,611.69
64,157.99	....	3,775,512.50	2,040,050.00	64,157.99	5,879,720.49
41,785.00	199.32	9,007,761.50	2,114,950.00	41,984.32	11,164,695.82
44,268.44	199.06	31,981,738.50	1,866,100.00	44,467.50	33,892,306 00
98,897.07	738.36	62,614,492.50	774,397.00	99,635.43	63,488,524.93
50,630.94	....	56,846,187.50	999,410.00	50,630.94	57,896,228.44
66,411.31	648.47	39,377,909.00	9,077,571.00	67,059.78	48,522,539.78
42,361.56	276.79	25,915,962.50	8,619,270.00	42,638.35	34,577,870.85
15,748.29	282.50	29,387,968.00	3,501,245.00	16,030.79	32,905,243.79
26,904.63	202.15	36,857,768.50	5,142,240.00	27,106.78	42,027,115.28
177,834.56	175.90	32,214,040.00	5,478,760.00	178,010.46	37,870,810.46
246,000.00	....	22,938,413.50	8,495,370.00	246,000.00	31,679,783.50
364,000.00	....	14,780,570.00	3,284,450.00	364,000.00	18,429,020.00
205,660.00	....	23,473,654.00	2,259,390.00	205,660.00	25,938,704.00
101,000.00	....	83,395,530.00	3,783,740.00	101,000.00	87,280,270.00
280,750.00	....	20,875,997.50	1,252,516.50	280,750.00	22,409,264.00
498,400.00	....	22,445,482.00	809,267.80	498,400.00	23,753,149.80
529,737.14	....	20,081,415.00	609,917.10	926,687.14	21,618,019.24
354,292.86	....	28,295,107.50	691,005.00	968,552.86	29,954,665.36
98,265,00	....	31,435,945.00	982,409.25	1,042,960.00	33,461,314.25
98,210.00	....	23,828,625.00	908,876.25	1,819,910.00	26,557,411.25
102,665.00	....	19,371,387.50	1,074,343.00	1,697,150.00	22,142,880.50
64,200.00	....	17,582,987.50	1,266,143.00	963,000.00	19,812,130.50
4,680,577.44	39,926.11	729,047,572.50	136,478,368.40	10,891,393.55	876,417,334.45

XXIX.—Coinage of the Mints of the United States

RECAPITULATION—Continued.

Calendar years.	MINOR COINAGE.		
	Five cents.	Three cents.	Two cents.
Brought forward	$4,543,200.00	$748,620.00	$879,070.00
1870	240,300.00	40,050.00	17,225.00
1871	28,050.00	18,120.00	14,425.00
1872	301,800.00	25,860.00	1,300.00
1873	227,500.00	35,190.00	
1874	176,900.00	23,700.00	
1875	104,850.00	6,840.00	
1876	126,500.00	4,860.00	
1877			
1878	117.50	70.50	
1879	1,455.00	1,236.00	
1880	997.75	748.65	
1881	3,618.75	32,417.25	
1882	573,830.00	759.00	
1883	1,148,471.05	318.27	
1884	563,697.10	169.26	
1885	73,824.50	143.70	
1886	166,514.50	128.70	
1887	763,182.60	238.83	
1888	536,024.15	1,232.49	
1889	794,068.05	646.83	
1890	812,963.60		
1891	841,717.50		
1892	584,982.10		
1893	668,509.75		
1894	270,656.60		
1895	498,994.20		
1896	442,146.00		
1897	1,021,436.75		
1898	626,604.35		
1899	1,301,451.55		
1900	1,362,799.75		
1901	1,324,010.65		
1902	1,574,028.95		
Total	21,705,202.70	941,349.48	912,020.00

FROM THEIR ORGANIZATION, BY CALENDAR YEARS—Continued.

RECAPITULATION—Continued.

MINOR COINAGE.		TOTAL COINAGE.			TOTAL VALUE.
Cents.	Half cents.	Gold.	Silver.	Minor.	
$4,680,577.44	$39,926.11	$729,047,572.50	$136,478,368.40	$10,891,393.55	$876,417,334.45
52,750.00	....	23,198,787.50	1,378,255.50	350,325.00	24,927,368.00
39,295.00	....	21,032,685.00	3,104,038.30	99,890.00	24,236,613.30
40,420.00	....	21,812,645.00	2,504,488.50	369,380.00	24,686,513.50
116,765.00	....	57,022,747.50	4,024,747.60	379,455.00	61,426,950.10
141,875.00	....	35,254,630.00	6,851,776.70	342,475.00	42,448,881.70
135,280.00	....	32,951,940.00	15,347,893.00	246,970.00	48,546,803.00
79,440.00	....	46,579,452.50	24,503,307.50	210,800.00	71,293,560.00
8,525.00	....	43,999,864.00	28,393,045.50	8,525.00	72,401,434.50
57,998.50	....	49,786,052.00	28,518,850.00	58,186.50	78,363,088.50
162,312.00	....	39,080,080.00	27,569,776.00	165,003.00	66,814,859.00
389,649.55	....	62,308,279.00	27,411,693.75	391,395.95	90,111,368.70
392,115.75	....	96,850,890.00	27,940,163.75	428,151.75	125,219,205.50
385,811.00	....	65,887,685.00	27,973,132.00	960,400.00	94,821,217.00
455,981.09	....	29,241,990.00	29,246,968.45	1,604,770.41	60,093,728.86
232,617.42	....	23,991,756.50	28,534,866.15	796,483.78	53,323,106.43
117,653.84	....	27,773,012.50	28,962,176.20	191,622.04	56,926,810.74
176,542.90	....	28,945,542.00	32,086,709.90	343,186.10	61,375,438.00
452,264.83	....	23,972,383.00	35,191,081.40	1,215,686.26	60,379,150.66
374,944.14	....	31,380,808.00	33,025,606.45	912,200.78	65,318,615.23
488,693.61	....	21,413,931.00	35,496,683.15	1,283,408.49	58,194,022.64
571,828.54	....	20,467,182.50	39,202,908.20	1,384,792.14	61,054,882.84
470,723.50	....	29,222,005.00	27,518,856.60	1,312,441.00	58,053,302.60
376,498.32	....	34,787,222.50	12,641,078.00	961,480.42	48,389,780.92
466,421.95	....	56,997,020.00	8,802,797.30	1,134,931.70	66,934,749.00
167,521.32	....	79,546,160.00	9,200,350.85	438,177.92	89,184,688.77
383,436.36	....	59,616,357.50	5,698,010.25	882,430.56	66,196,798.31
390,572.93	....	47,053,060.00	23,089,899.05	832,718.93	70,975,677.98
504,663.30	....	76,028,485.00	18,487,297.30	1,526,100.05	96,041,882.35
498,230.79	....	77,985,757.50	23,034,033.45	1,124,835.14	102,144,626.09
536,000.31	....	111,344,220.00	26,061,519.90	1,837,451.86	139,243,191.76
668,337.64	....	99,272,942.50	36,345,321.45	2,031,137.39	137,649,401.34
796,111.43	....	101,735,187.50	30,838,460.75	2,120,122.08	134,693,770.33
873,767.22	....	47,184,932.50	30,028,167.20	2,447,796.17	79,660,895.87
15,685,625.68	39,926.11	2,352,773,265.50	875,492,328.50	39,284,123.97	3,267,549,717.97

INDEX.

A.

Page.

Abyssinia, coinage of, 1900 and 1901 348
Africa:
  German East, coinage of, 1900, 1901, and 1902 348
  French colonies in, production of gold 282
  Gold mines of the Gold Coast 282
  Production of gold, 1900, 1901, and 1902 349
  Production of gold, details of 280
Alabama, production of:
  Estimate of Director 15
  Estimate of D. K. Pope 14
  Statistics of, by D. K. Pope 186, 192
Alaska, production of:
  Estimate of Director 15
  Estimate of Charles G. Yale 14
  Statistics of, by Charles G. Yale 49
American East Indies, production of gold in Philippine Islands 272
Amount and cost of silver bullion purchased, used in coinage of silver dollars, wasted, sold in sweeps, and seigniorage since 1890 21
Amount, cost, average price, and bullion value of silver dollars since 1878 21
Appalachian Range, production of:
  Estimate of Director 15
  Estimate of D. K. Pope 14
  Statistics of, by D. K. Pope 186
Approximate distribution of gold and silver of producing States and Territories, estimate by the Director 15
Approximate gold product:
  Disposition of 13
  Mines of United States 13
Approximate silver product:
  Disposition of 14
  Mines of United States 13
Arabia, coinage of, 1900 and 1902 348
Argentina:
  Production of gold and silver, 1900, 1901, and 1902 349
  Production of gold and silver, details of 251
Arizona, production of:
  Estimate of Director 15
  Estimate of Charles C. Randolph 14
  Statistics of, by Charles C. Randolph 55
Art and manufactures:
  Gold and silver used in the United States 35
  Gold and silver used in the world 39
Assets and liabilities, mints and assay offices 309
Australasia:
  Coinage of, 1900, 1901, and 1902 348
  Gold production, by colonies 277
  Production of gold and silver, 1900, 1901, and 1902 349
  Production of gold and silver, details of 276
  Production of fine silver, by colonies 277

	Page.
Austria-Hungary:	
Coinage of, 1900, 1901, and 1902	348
Industrial consumption	40
Production of gold and silver, 1900, 1901, and 1902	349
Production of gold and silver, details of	261
Average, highest, and lowest price of silver	30
Average, highest, and lowest price of silver in London since 1833	312
Average price, amount, cost, and bullion value of silver dollar since 1878	21

B.

Balance of silver bullion on hand January 1, 1903	22
Bars:	
Gold exchanged for gold coin	37
Furnished for use in the arts since 1880	38
Manufactured at mints and assay offices, tables of	298
Belgium, coinage of, 1901	348
Bolivia:	
Coinage of, 1901	348
Production of gold and silver, 1900, 1901, and 1902	349
Production of gold and silver, details of	246
Borneo, production of gold in	271
Brazil:	
Coinage of, 1902	348
Mining in	243
Production of gold, 1900, 1901, and 1902	349
Production of gold, details of	242
British colonies in Africa, production of gold	281
British Columbia:	
Production, details of	224
British East Indies, production of:	
1900, 1901, and 1902	349
Production, details of	270
Malay States	270
New Guinea	270
British Guiana:	
Coinage of, 1900 and 1901	348
Production of gold, 1900, 1901, and 1902	349
Details of	236
British Honduras, coinage of, 1901 and 1902	348
British India:	
Coinage of, 1900, 1901, and 1902	348
Production of gold, 1900, 1901, and 1902	349
Production of gold, details of	268
British North America, gold and silver production, details of	223
Bullion:	
In mints and assay offices, December 31, 1902	34
Silver, average, highest, and lowest price	30
Silver, balance on hand January 1, 1903	22
Bullion value of silver dollar, amount, cost, and average price since 1878	21

C.

California, production of:	
Estimate of Director	15
Estimate of Charles G. Yale	14
Statistics of, by Charles G. Yale	76
Canada:	
Coinage of, 1900, 1901, and 1902	348
Production of gold and silver, 1900, 1901, and 1902	349
Production of gold and silver, details of	223
Cape Colony, gold production of	282
Central America, production of gold and silver:	
1900, 1901, and 1902	349
Details of	231
Ceylon, coinage of, 1900 and 1902	348
Chile:	
Production of gold and silver, 1900, 1901, and 1902	349
Production of gold and silver, details of	248

China: Page.
  Production of gold, 1900, 1901, and 1902 349
  Production of gold, details of 265
Circulation of money in the United States, January 1, 1903 35
Coin subsidiary, cost of silver purchased 21
Coinage:
  United States, calendar year 20
  United States, 1900, 1901, and 1902 348
  United States since 1873, by weight and value 20
  United States since organization of Mint, 1792 354
  World, 1900, 1901, and 1902 46
  World, 1900, 1901, and 1902, table of 348
  World since 1873, by weight and value 46
Colombia:
  Exports of gold and silver 234
  Production of gold and silver, 1900, 1901, and 1902 349
  Production of gold and silver, details of 234
Colorado, production of:
  Estimate of Director 15
  Estimate of F. M. Downer 14
  Statistics of, by F. M. Downer 88
Commercial value of silver 30
Commercial ratio of silver to gold since 1687 313
Cost, amount, average price, and bullion value of silver dollars since 1878 21
Cost of silver purchased for subsidiary coinage 21
Costa Rica, coinage of, 1900 349
Course of silver 30
Crete, coinage of, 1901 348
Curaçao, coinage of, 1900 and 1901 348
Cyprus, coinage of, 1900 348

D.

Denmark, coinage of, 1900 348
Deposits of gold and silver:
  At mints and assay offices 17–18
  At mints and assay offices, since 1880 19
Distribution:
  Approximate, of gold and silver, by producing States and Territories, estimate of Director 15
  Of gold and silver product, by agents 14
  Of gold and silver, by States and Territories 15
Dollar, silver, amount, cost, average price, and bullion value since 1878 21
Dutch East Indies:
  Coinage of, 1900 and 1901 348
  Production of gold in Borneo 271
Dutch Guiana, production of gold:
  1900, 1901, and 1902 349
  Details of 238

E.

East India, British, production in New Guinea 270
East Indies:
  American, production of gold in Philippine Islands 272
  British, production of gold, 1900, 1901, and 1902 349
  British, production of Malay States 270
  Dutch, production of gold, 1900, 1901, and 1902 349
  Dutch, production of gold in Borneo 271
  Dutch, production of gold in Sumatra 271
  Dutch, production of gold in Celebes 271
Ecuador:
  Coinage of, 1900 and 1902 348
  Production of gold and silver, 1900, 1901, and 1902 349
  Production of gold and silver, details of 240
Egypt:
  Coinage of, 1900 and 1901 348
  Production of gold and silver 260, 285

Page.

- Employment of gold and silver in industrial arts in—
  - United States, 35
  - World, 39
- Estimate of Director of gold and silver product of the United States, 15
- Exports and imports:
  - Gold and silver bullion into and from London, 33
  - Gold and silver bullion and coin, 22
  - Gold and silver bullion and coin, tables of, 314
  - Principal countries of the world, 26
- Exports:
  - Gold and silver from Colombia, 234
  - Exports of silver to the East, 31

F.

- Finland:
  - Production, details of, 258
  - Production of, 1900, 1901, and 1902, 349
- Fluctuation in price of silver, 30
- Form and distribution of stock of money in United States, January 1, 1902, 35
- Formosa, mining in, 269
- France:
  - Coinage of, 1900, 1901, and 1902, 348
  - Industrial consumption, 40
  - Production of silver, 1900, 1901, and 1902, 349
  - Production of silver, details of, 262
- French colonies in Africa, gold production of, 282
- French Guiana, production of gold:
  - 1900, 1901, and 1902, 349
  - Details of, 239

G.

- Georgia, production of:
  - Estimate of Director, 15
  - Estimate of D. K. Pope, 14
  - Statistics by D. K. Pope, 186, 191
- German East Africa, coinage of, 1900, 1901, and 1902, 348
- Germany:
  - Coinage of, 1900, 1901, and 1902, 348
  - Production of gold and silver, 1900, 1901, and 1902, 349
  - Production of gold and silver, details of, 260
- Gold and silver:
  - Approximate distribution, by States, and estimate of Director, 15
  - Bullion in mints and assay offices January 1, 1903, 34
  - Bullion imported and exported into and from London, 33
  - Coinage of the world, 1900, 1901, and 1902, 46
  - Coinage, by nations, 1900, 1901, and 1902, tables of, 348
  - Coinage of world, weight and value since 1873, 46
  - Deposits of, 17–18
  - Product of mines of the United States since 1860, 17
  - Product of the United States, estimate of agents, 14
  - Product of the United States, estimate of the Director, 15
  - Product of world, weight and value since 1860, 45
  - Production of Argentina, 251
  - Production of Australasia, 276
  - Production of Austria-Hungary, 261
  - Production of British North America, 223
  - Production of Bolivia, 246
  - Production of Central America, 231
  - Production of Colombia, 234
  - Production of Chile, 248
  - Production of Ecuador, 240
  - Production of Finland, 258
  - Production of Germany, 260
  - Production of Great Britain, 260
  - Production of Italy, 263
  - Production of Japan, 269
  - Production of Mexico, 226
  - Production of Peru, 244

Gold and silver—Continued. Page.
- Production of Portugal 263
- Production of Russia 256
- Production of Spain 262
- Production of Sweden 259
- Production of Turkey 264
- Production in the world 42
- Received at mints and assay offices since 1880 19
- Used in industrial arts in the United States 35

Gold:
- Bars exchanged for gold coin 37
- Bars manufactured at mints and assay offices, table of 298
- Bullion deposited at mints and assay offices 17
- Bullion deposited at mints and assay offices since 1880 19
- Bullion, stock of, in United States December 31, 1902 34
- Coinage of the mints of the world since 1873 20
- Coinage of United States 20
- Coinage of United States, table of 306
- Coinage of United States since 1873, weight and value 20
- Coinage of United States from organization of Mint, 1792 354
- Coinage of various countries, 1900, 1901, and 1902, table of 348
- Deposits at mints and assay offices 17
- Imports and exports 22
- Imports and exports, 1902, tables of 314
- Philippine Islands 272
- The Transvaal 281
- Mines of the Gold Coast, Africa 282
- Mines of the Ivory Coast 283
- Mines of Siberia 257
- Mining in Korea 266
- Movement from United States 25
- Product of mines of United States since 1860 17
- Product of mines of United States, approximate 9
- Product of mines of United States, approximate disposition 15
- Product of mines distributed by States and Territories 15
- Product of mines reported by mint officers and agents 15
- Production of United States, 1900, 1901, and 1902, table of 349
- Production of the United States, 1902 9
- Production of the United States, 1902, estimate of Director 15
- Production of the United States, 1902, by placer and quartz mining 16
- Production of the world 42
- Production of the world, table of 349
- Production of the world since 1860, by weight and value 45
- Production of Africa 280
- Production of Brazil 242
- Production of British East Indies 270
- Production of British India 268
- Production of Dutch East Indies 271
- Production of Cape Colony 282
- Production of China 265
- Production of French colonies of Africa 282
- Production of Klondike 223
- Production of Korea 265
- Production of Madagascar 282
- Production of Nova Scotia 226
- Production of Rhodesia 281
- Production of Transvaal 281
- Production of Uruguay 254
- Production of Venezuela 240
- Production of Western Australia since 1886 277
- Production of British Guiana 236
- Production of Dutch Guiana 238
- Production of French Guiana 238
- Used for industrial purposes in United States 35
- Used for industrial purposes in United States since 1880 38
- Used for industrial purposes in world 39

Gold Coast of Africa, gold mines in 282

Government purchases of silver 21

	Page.
Great Britain:	
Coinage of, 1900, 1901, and 1902	348
Industrial consumption	40
Production of gold and silver, 1900 and 1901	349
Production of gold and silver, details of	260
Greece:	
Production of silver, 1900 and 1901	349
Production of silver, details of	264
Guatemala, coinage of, 1901	348
Guiana, British: Production of gold—	
1900, 1901, and 1902	349
Details of	236
Guiana, Dutch: Production of gold—	
1900, 1901, and 1902	349
Details of	238
Guiana, French: Production of gold—	
1900, 1901, and 1902	349
Details of	239

H.

Highest, lowest, and average price of silver in:	
United States	30
London since 1833	312
Honduras, British:	
Coinage of, 1901 and 1902	348
Gold in	232
Hongkong coinage, 1900, 1901, and 1902	348
Hungary, industrial consumption of gold	40

I.

Idaho, production of:	
Estimate of Director	15
Estimate of J. W. Cunningham	14
Statistics of, by J. W. Cunningham	134
Imports of silver into India, value of	32
Imports and exports:	
Gold and silver	22
Gold and sllver bullion into and from London	33
Gold and silver, tables of	314
Principal countries of the world	26
India:	
British, coinage of, 1900, 1901, and 1902	348
Production of gold, 1900, 1901, and 1902	349
Production of gold, details of	268
Value of silver imports into	32
Indo-China coinage, 1900, 1901, and 1902	348
Industrial arts:	
Gold and silver used in United States	35
Consumption of gold and silver in the world	39
Italy:	
Coinage of 1900, 1901, and 1902	348
Production of gold and silver, 1900, 1901, and 1902	349
Production of gold and silver, details of	263

J.

Japan:	
Coinage of 1900, 1901, and 1902	348
Production of gold and silver, 1900, 1901, and 1902	349
Production of gold and silver, details of	269

K.

Klondike, production of gold	223
Korea:	
Coinage of, 1901 and 1902	348
Production of gold, 1900, 1901, and 1902	349
Production of gold, details of	265
Mining in	266

L.

Page.

Letter of transmittal 5
Liabilities and assets, mints and assay offices 309
Location of moneys of United States 35

M.

Madagascar gold production 282
Market for silver 30
Maryland, production of:
    Estimate of Director 15
    Estimate of D. K. Pope 14
    Statistics of, by D. K. Pope 186, 188
Metallic stock 34
Mexico:
    Coinage of, 1900, 1901, and 1902 348
    Mining industry in 227
    Production of gold and silver, 1900, 1901, and 1902 349
    Production of gold and silver, details of 226
Michigan, production of, estimate of Director 15
Minerals of the Philippine Islands 272
Mining:
    In Brazil 243
    In Ecuador 240
    In Mexico 227
Minor coinage of United States 20
Monaco, coinage of, 1901 348
Money in United States, stock of 34
Moneys of United States, metallic and paper, location of 35
Montana, production of:
    Estimate of Director 15
    Estimate of B. H. Tatem 14
    Statistics of, by B. H. Tatem 143
Morocco, coinage of, 1900, 1901, and 1902 348
Movement of gold from the United States 25
Mines of United States:
    Approximate gold product of 13
    Approximate disposition of product 13
    Gold and silver product since 1860 17

N.

New South Wales, production of 279
New Zealand, production of 276
Netherlands:
    Coinage of, 1900, 1901, and 1902 348.
    Industrial consumption 41
Nevada, production of:
    Estimate of Director 15
    Estimate of R. K. Colcord 14
    Statistics of, by R. K. Colcord 150
    The Comstock lode, by Alfred Doten 153
    Tonopah mining district, by Alfred Doten 162
Newfoundland:
    Coinage of, 1900 348
    Production of gold and silver 225
New Guinea, production of gold 270
New Mexico, production of:
    Estimate of Director 15
    Estimate of J. L. Hodges 14
    Statistics of, by F. A. Jones 168
North Carolina, production of:
    Estimate of Director 15
    Estimate of D. K. Pope 14
    Statistics of, by D. K. Pope 186, 189

Page.

Norway:
  Coinage of, 1900, 1901, and 1902 348
  Production of silver, 1900, 1901, and 1902 349
  Production of silver, details of 258
Northwest Territories, production of gold 223
Notes of United States outstanding December 31, 1902 35
Nova Scotia, gold production of 226

O.

Ontario, production of gold 225
Oregon, production of:
  Estimate of Director 15
  Estimate of F. A. Wing 14
  Statistics of, by F. A. Wing 178

P.

Paper money in circulation in United States, December 31, 1902 35
Paraguay, production of 254
Persia:
  Coinage of, 1901 and 1902 348
  Production of gold and silver 264
Peru:
  Coinage of, 1900, 1901, and 1902 348
  Production of gold and silver, 1900, 1901, and 1902 349
  Production of gold and silver, details of 244
Philippine Islands, gold in 272
Porto Rico, production of 231
Portugal:
  Coinage of, 1900 and 1901 348
  Industrial consumption 41
  Production of gold and silver, 1900, 1901, and 1902 349
  Production of gold and silver, details of 263
Price of silver 30
Production of gold in—
  Africa 280
  American East Indies 272
  Brazil 242
  British colonies in Africa 281
  British East Indies 270
  British India 268
  British Guiana 236
  China 265
  Dutch East Indies 271
  Dutch Guiana 238
  French colonies in Africa 282
  French Guiana 239
  Korea 265
  Klondike 223
  Madagascar 282
  Malay States 270
  New South Wales 279
  Northwest Territories 223
  Nova Scotia 226
  Ontario 225
  Philippine Islands 272
  Quebec 223
  Rhodesia 281
  Siam 268
  The Guianas 236
  The Transvaal 281
  Uruguay 254
  Venezuela 240
  Western Australia 277
  West Indies 229
  Cape Colony 282
Product of gold mines of United States since 1860 17

Productoin of gold and silver in— Page.
  Alabama, estimate of Director 15
  Alabama, estimate of D. K. Pope 14
  Alabama, statistics of, by D. K. Pope 192
  Alaska, estimate of Director 15
  Alaska, estimate of Charles G. Yale 14
  Alaska, statistics of, by Charles G. Yale 49
  Arizona, estimate of Director 15
  Arizona, estimate of Charles C. Randolph 14
  Arizona, statistics of, by Charles C. Randolph 55
  California, estimate of Director 15
  California, estimate of Charles G. Yale 14
  California, statistics of, by Charles G. Yale 76
  Colorado, estimate of Director 15
  Colorado, estimate of F. M. Downer 14
  Colorado, statistics of, by F. M. Downer 88
  Georgia, estimate of Director 15
  Georgia, estimate of D. K. Pope 14
  Georgia, statistics of, by D. K. Pope 191
  Idaho, estimate of Director 15
  Idaho, estimate of J. W. Cunningham 14
  Idaho, statistics of, by J. W. Cunningham 134
  Maryland, estimate of Director 15
  Maryland, estimate of D. K. Pope 14
  Maryland, statistics of, by D. K. Pope 188
  Michigan, estimate of Director 15
  Montana, estimate of Director 15
  Montana, estimate of B. H. Tatem 14
  Montana, statistics of, by B. H. Tatem 143
  Nevada, estimate of Director 15
  Nevada, estimate of R. K. Colcord 14
  Nevada, statistics of, by R. K. Colcord 150
  New Mexico, estimate of Director 15
  New Mexico, estimate of F. A. Jones 14
  New Mexico, statistics of, by F. A. Jones 168
  North Carolina, estimate of Director 15
  North Carolina, estimate of D. K. Pope 14
  North Carolina, statistics of, by D. K. Pope 189
  Oregon, estimate of Director 15
  Oregon, estimate of F. A. Wing 14
  Oregon, statistics of, by F. A. Wing 178
  South Carolina, estimate of Director 15
  South Carolina, estimate of D. K. Pope 14
  South Carolina, statistics of, by D. K. Pope 191
  South Dakota, estimate of Director 15
  South Dakota, estimate of F. R. Carpenter 14
  South Dakota, statistics of, by F. R. Carpenter 194
  Tennessee, estimate of Director 15
  Tennessee, estimate of D. K. Pope 14
  Tennessee, statistics of, by D. K. Pope 193
  Texas, estimate of Director 15
  United States, 1900, 1901, and 1902 349
  United States, details of 9
  United States, since 1860 17
  United States, by States and Territories 15
  United States, by Mint officers and agents 14
  United States, placer and quartz mining 16
  Utah, estimate of Director 15
  Utah, estimate of B. H. Tatem 14
  Utah, statistics of, by B. H. Tatem 200
  Virginia, estimate of Director 15
  Virginia, estimate of D. K. Pope 14
  Virginia, statistics of, by D. K. Pope 188
  Washington, estimate of Director 15
  Washington, estimate of F. A. Wing 14
  Washington, statistics of, by F. A. Wing 207
  Wyoming, estimate of Director 15

Production of gold and silver in— Page.
  Wyoming, estimate of F. R. Carpenter 14
  Wyoming, statistics of, by F. R. Carpenter 214
  World, 1900, 1901, and 1902 349
  World, since the discovery of America, table of 352
  World 42
  World, since 1860, weight and value 45
Production of silver in the United States—
  1902 13
  Since 1860 17
  By States and Territories 15
  Estimate of Director 15
  Reported by mint officers and agents 14
Production—
  Of fine silver in Australasia, by colonies 277
  Foreign countries 221
  Foreign countries, table of 349
  Argentina 251
  Australasia 277
  Austria-Hungary 261
  British North America 223
  Bolivia 246
  Central America 231
  Colombia 234
  Chile 248
  Ecuador 240
  Germany 260
  Great Britain 260
  Italy 263
  Japan 269
  Mexico 226
  New Zealand 276
  Paraguay 254
  Peru 244
  Porto Rico 231
  Portugal 263
  Russia 256
  Spain 262
  Sweden 259
  Turkey 264
  Uruguay 254
  Venezuela 240
Production of silver—
  France 262
  Greece 264
  Norway 258
Product of—
  Mines of United States, approximate disposition of 13
  Silver mines of United States 13
Purchase of silver 21
Purchase of silver and cost of, for subsidiary coin 21

Q.

Queensland:
  Production of gold 278
Quebec:
  Production of gold 223

R.

Ratio of silver to gold each year since 1687 313
Reports of special agents on production of precious metals in the States and Territories 47
Rhodesia:
  Production of gold 281
Russia:
  Coinage of, 1900, 1901, and 1902 348
  Production of gold and silver, 1900, 1901, and 1902 349
  Production of gold and silver, details of 256

S.

Page.

- Sarawak, coinage of, 1900 ... 348
- Seigniorage on coinage of silver dollars wasted, sold in sweeps, since 1890 ... 21
- Siam:
  - Coinage of, 1900, 1901, and 1902 ... 348
  - Production of ... 268
- Siberia, gold mines of ... 257
- Silver and gold:
  - Approximate distribution by States and Territories, estimate of Director ... 15
  - Bullion in the mints and assay offices December 31, 1902 ... 34
  - Bullion imported and exported into and from London ... 33
  - Coinage of world since 1873 ... 46
  - Production by States, reported by agents ... 14
  - Production of mines of United States since 1860 ... 17
  - Production of the world ... 42
  - Received at mints and assay offices since 1880 ... 19
  - Production in the world since 1860 ... 45
  - Production in the world, 1900, 1901, and 1902, tables of ... 349
- Silver:
  - Average price of, 1902 ... 30
  - Bars furnished for use in the arts ... 35
  - Bars manufactured at mints and assay offices, tables of ... 298
  - Bullion, balance on hand January 1, 1903 ... 22
  - Bullion deposited at mints and assay offices ... 19
  - Bullion in mints and assay offices ... 22
  - Bullion, value of fine ounce ... 30
  - Bullion wasted, coined, and seigniorage since 1890 ... 21
  - Coinage of United States ... 20
  - Coinage of United States since 1873, weight and value ... 20
  - Coinage of various countries, 1900, 1901, and 1902, tables of ... 348
  - Course of ... 30
  - Deposits of ... 18
  - Dollars, amount, cost, average price, and bullion value since 1878 ... 21
  - Exports to the East ... 31
  - Highest, lowest, and average price of ... 30
  - Highest, lowest, and average price of, in London, since 1833 ... 312
  - Imports into India, value of ... 32
  - Imports and exports ... 22
  - Imports and exports, table of ... 314
  - Market for ... 30
  - Product of mines of United States ... 13
  - Product of mines of United States since 1860 ... 17
  - Product of mines of United States, disposition of ... 13–14
  - Product of mines distributed, by States and Territories ... 15
  - Product of mines reported by Mint officers and agents ... 14
  - Production of, in United States, 1900, 1901, and 1902 ... 349
  - Production of, in United States, 1902 ... 13
  - Production of, in United States, estimate of Director ... 15
  - Production of world ... 42
  - Production of world since 1860, weight and value ... 45
  - Production in foreign countries ... 221
  - Production of France ... 262
  - Production of Greece ... 264
  - Production of Norway ... 258
  - Production of Canada ... 225
  - Production of British Columbia ... 224
  - Production of British North America ... 223
  - Purchases ... 21
  - Purchase of subsidiary coin, cost of ... 21
  - Used in industrial arts in the United States ... 35
  - Used in the industrial arts in the United States since 1880 ... 38
  - Used in the industrial arts in the world ... 39
- South Appalachian States, production of:
  - Estimate of Director ... 15
  - Estimate of D. K. Pope ... 14
  - Statistics of, by D. K. Pope ... 186

Page.

- South Carolina, production of:
  - Estimate of Director 15
  - Estimate of D. K. Pope 14
  - Statistics of, by D. K. Pope 186, 191
- South Dakota, production of:
  - Estimate of Director 15
  - Estimate of F. R. Carpenter 14
  - Statistics of, by F. R. Carpenter 194
- Spain:
  - Coinage of, 1900 and 1902 348
  - Production of gold and silver, 1900, 1901, and 1902 349
  - Production of gold and silver, details of 262
- Straits Settlements, coinage of, 1900, 1901, and 1902 348
- Stock of money in the United States 34
- Subsidiary coin, cost of silver purchased for 21
- Sweden:
  - Coinage of, 1900, 1901, and 1902 348
  - Industrial consumption 41
  - Production of gold and silver, details of 259
  - Production of gold and silver, 1900, 1901, and 1902 349
- Switzerland:
  - Coinage of, 1900, 1901, and 1902 348
  - Industrial consumption 41

T.

- Tables:
  - Assets and liabilities, mints and assay offices 309
  - Bars, manufactured, standard ounces 298
  - Bars, manufactured, value 300
  - Coinage, United States 306
  - Coinage, United States, by institutions, since 1792 356
  - Coinage, United States, fractional and sudsidiary, since 1792 355
  - Coinage, United States, since organization of Mint, by denominations and value 354
  - Coinage, various countries, 1900, 1901, and 1902 348
  - Domestic coins for recoinage 300
  - Deposits and purchases of gold and silver, standard ounces 288
  - Deposits and purchases of gold and silver, value 290
  - Deposits of unrefined gold, standard ounces 292
  - Deposits of unrefined gold, value 294
  - Deposits of unrefined gold and silver, from organization of Mint 310
  - Deposits of unrefined silver, standard ounces 296
  - Deposits of unrefined silver, value 298
  - Highest, lowest, and average price of silver in London since 1833 312
  - Imports and exports of gold and silver 314
  - Imports and exports, principal countries of the world 316, 323
  - Production of gold and silver in the world from 1492 352
  - Production of gold and silver in the United States since 1792 311
  - Production of gold and silver in the world, 1900, 1901, and 1902 349
  - Quantity and cost of metal obtained by transfer and purchase for subsidiary coinage 303
  - Quantity and cost of silver used in coinage of silver dollars 302
  - Ratio of silver to gold each year since 1687 313
  - Recoinage of the United States 300
  - Silver for subsidiary coinage 303
  - Unrefined domestic gold and silver deposited by the States and Territories since 1792 310
- Tennessee:
  - Production of, estimate of Director 15
  - Production of, estimate of D. K. Pope 14
  - Production of, statistics of, by D. K. Pope 186, 193
- Texas, production of, estimate of Director 15
- Transvaal, production of gold 281
- Tunis, coinage of, 1900, 1901, and 1902 348
- Turkey:
  - Coinage of, 1900, 1901, and 1902 348
  - Production of gold and silver, 1900, 1901, and 1902 349
  - Production of gold and silver, details of 264

U.

	Page.
United States:	
Approximate disposition of product	13
Coinage of, 1900, 1901, and 1902	348
Coinage of, since 1873	20
Coinage of, 1901	20
Coinage, table of	306
Coinage of, since organization of Mint	354
Money, metallic and paper, location of	35
Production, 1900, 1901, and 1902	349
Production, details of	9
Product of, gold and silver, estimate of Director	15
Product of, gold and silver, estimate of agents	14
Stock of money	34
Use of gold and silver in industrial arts	35
Uruguay, production of gold:	
1900, 1901, and 1902	349
Details of	254
Utah, production of:	
Estimate of Director	15
Estimate of B. H. Tatem	14
Statistics of, by B. H. Tatem	200

V.

Valne of net silver imports into India	32
Venezuela:	
Coinage of, 1901 and 1902	348
Production of gold, details of	240
Production of gold, 1900, 1901, and 1902	349
Virginia, production of:	
Estimate of Director	15
Estimate of D. K. Pope	14
Statistics of, by D. K. Pope	188

W.

Washington, production of:	
Estimate of Director	15
Estimate of F. A. Wing	14
Statistics of, by F. A. Wing	207
Wasted in coinage of silver dollars, sold in sweeps, and seigniorage since 1890	21
Western Australia, gold production of, since 1886	277
West Indies, gold in	229
World's coinage, 1900, 1901, and 1902	46
World's coinage, 1900, 1901, and 1902, table of	348
World's coinage since 1873, weight and value	49
World's industrial consumption of gold and silver	39
World's production of gold and silver	42
World's production of gold and silver since 1860, weight and value	45
World's production of gold and silver, 1900, 1901, and 1902	349
Wyoming, production of:	
Estimate of Director	15
Estimate of F. R. Carpenter	14
Statistics of, by F. R. Carpenter	214
West Coast of Africa, mining in	283

Y.

Yukon and Klondike (*see* British North America)	223

O